CARBON DISCLOSURE PROJECT

Carbon Disclosure Project Report 2008
JSE Top 100

On behalf of 385 investors with assets of $57 trillion

Lead project partner:

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The National Business Initiative, lead partner in South Africa for the CDP6, extends its sincere appreciation to our lead sponsor KPMG South Africa, as well as our co-sponsors: Frater Asset Management, Macquarie First South Securities and Nedbank Group for recognising the value of this project in South Africa and investing in its implementation.

We also acknowledge the important role played by Incite Sustainability in the analysis and writing of this report. Incite Sustainability is a South African consultancy that provides strategy and implementation advice on sustainability policy and practice to the private and public sectors.

Finally, a special note of thanks goes to those JSE Top 100 companies that responded to the 2008 questionnaire, as well as our various independent contributors to the report. We are confident that it will fulfill its main purpose of supporting investors in their decision-making processes, but also that it will provide valuable information for a variety of initiatives in the fields of energy and climate change.

For further information on how you may become involved in the NBI's key initiatives, please visit our website (www.nbi.org.za) or contact Valerie Geen on geen.valerie@nbi.org.za.

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Produced by Pure Media (Pty) Ltd
www.puremedia.co.za

Typesetting and Printing by
Supreme Printers (Pty) Ltd

Carbon Disclosure Project 2008

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CARBON DISCLOSURE PROJECT

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Foreword by the Minister of Environmental Affairs and Tourism, Marthinus van Schalkwyk

"If we continue with business-as-usual, we will go out of business."

Minister van Schalkwyk
Minister of Environmental Affairs and Tourism

The latest climate science and economics makes it clear that a business-as-usual approach in the face of climate change is unsustainable. In July 2008, cabinet agreed on an ambitious approach for South Africa, setting a strategic direction for national climate policy to ensure we do our fair share in the international context. The approach laid out government's vision, strategic direction and framework for climate policy. It is based on the Long-Term Mitigation Scenarios for Climate Change (LTMS) and the strategic options modelled in the LTMS.

The LTMS process was based on robust scientific and economic research and developed by experts from a range of sectors. As a developing country, South Africa is stepping up to make a fair and meaningful contribution to solving the challenge of global climate change. Cabinet has sent a clear signal that emissions need to peak at the latest by 2020-25, then plateau for about a decade, and then start to decline up to mid-century.

The business community has responded positively to the "required by science" scenario. Dialogues with all sectors to explore the best choice of mechanisms to support such a path have already begun. The enormity of the challenge will require an unprecedented and galvanised effort by government, business and labour, the scientific community and society as a whole.

Taking a long-term view, South Africa's goal is to make a transition to a low-carbon economy that is also able to promote job creation and development in a carbon-constrained future. The South African government as a whole understands that the country's new competitive advantage will lie in becoming world leaders in climate-friendly technology. It seeks first-mover advantage and understands the challenge of re-orientating domestic strategy in a future global economy that will be constrained in terms of carbon. Climate change mitigation is seen as a pro-growth, pro-job and pro-development strategy of the future.

This strategic direction will be given effect, inter alia, by setting more ambitious domestic targets for energy efficiency, renewables and transport. Increasingly, mandatory action is needed rather than voluntary action. In developing formal policy, state-led regulation will play a key role, complemented by getting the economic incentive structure right. The latter includes putting an escalating price on carbon. Greater investment in long-term research and development will be crucial on the road to a low-carbon society.

It is in this context that I welcome the proactive approach of the National Business Initiative (NBI) and the JSE-listed companies that have contributed to this year's Carbon Disclosure Project. The report reveals a greater depth of engagement on climate change: more companies are quantifying their emissions, awareness and understanding are on the increase and many companies are holding their boards accountable for climate change performance. Very importantly, more companies are also beginning to take advantage of the opportunities presented by climate change.

Many of these visionary "climate leaders" are not only doing the right thing by becoming active partners to a solution, but they are also positioning themselves to be the most competitive and profitable businesses in a carbon constrained world. Ultimately, all companies in South Africa, and indeed throughout the world, will have to take up their responsibility in achieving a global solution.

Marthinus van Schalkwyk
Minister of Environmental Affairs and Tourism

Partner and Sponsor Forewords

National Business Initiative (NBI)

In recognition of the serious implications of climate change for business, this year the NBI became lead partner and managing entity of the CDP in South Africa. This year's CDP has been a huge jump by its extension from the JSE Top 40 in 2007 to the JSE Top 100; the response this year has been remarkable.

South Africa will remember 2008 as the year that brought climate change into sharp focus as a priority for both the private sector and government.

In June, Sasol, Eskom and Transnet threw their weight behind the World Business Council for Sustainable Development/World Economic Forum post-2012 long-term climate change policy framework. This framework calls for at least a 50% reduction in global greenhouse gas emissions by 2050 and seeks a comprehensive, market-oriented, global agreement to drive the process.

A month later, cabinet approved an ambitious national climate change vision and mitigation strategy. It outlines milestones that are set to culminate in the introduction of a legislative, regulatory and fiscal package to give effect to the strategic direction and policy from now up to 2012.

The NBI's various discussions with some senior executives of its member companies have all pointed to an unreserved acceptance of their role in mitigating the effects of climate change.

The importance attached to the role of business leadership in mitigating climate change made managing the CDP6 (2008) a priority. The NBI is encouraged by the additional group of companies that participated this year. It is clear that more companies than ever in South Africa are thinking about climate change, quantifying their carbon footprints and making plans to reduce them.

With due recognition of this important progress, the scale of the challenge is far from being met with an adequate solution. The NBI looks forward to working with business and government to identify some of these solutions. It also believes that those companies that are providing the leadership in mitigating the risks of climate change today will also be the market leaders of the future, where markets will be shaped by the need for clean technology, renewable energy, waste reduction and customer demands for sustainable products, services and supply chains. At the same time, the private sector must recognise the fragility of natural resources and eco-systems and provide tangible solutions for a more sustainable world. The CDP6 (2008) provides a solid platform for this journey.

André Fourie
Chief Executive, National Business Initiative

Incite Sustainability

Incite Sustainability is proud to have initiated both the Carbon Disclosure Project (CDP) in South Africa, and to have undertaken the analysis for this year's CDP report. It is very encouraging to see that what started as an informal discussion between Incite Sustainability and the CDP office in London four years ago has taken a firm hold in South Africa. The response last year was a good start; the take-up this year has been even more promising.

Incite Sustainability is a South African consultancy that encourages the public and private sector to greater engagement in addressing the challenges associated with sustainable development. Climate change is undoubtedly one of the most significant sustainability challenges the country is facing, though it is certainly not the only one.

The principal motivation for bringing the CDP to this country, in partnership with the NBI, was to stimulate informed debate within the business media and the financial sector, two key levers in effecting change in the corporate sector. Incite Sustainability is proud of the results that this initiative has brought.

It is evident that climate change has become an increasingly material issue in the local business and financial sector. Some South African food exporters are feeling pressure from foreign retailers to account for their climate change performance; many in the agricultural sector are already witnessing shifts in weather patterns that they are attributing to climate change; and some large local emitters for the first time have faced tough questions on their climate change performance at their AGMs. While the local business and financial community may be seen as generally lagging behind their foreign counterparts, the results of this year's report show that South African business is starting to catch up quickly. This year, it is particularly encouraging to see the significant increase in the number of companies that are

beginning to measure and report on their greenhouse gas emissions.

International negotiators are currently preparing for the all-important climate change talks in Copenhagen next year, where a number of developing countries, including South Africa, will be under pressure to adopt emission reduction targets. The development of an appropriate negotiating position by South Africa in Copenhagen will need to understand South Africa's emission levels and the impacts they have on the economy. The CDP process can make a useful contribution to this process.

Jonathon Hanks
Managing Partner, Incite Sustainability

KPMG

Carbon is increasingly a key factor affecting businesses. How well business understands and grasps the risks and opportunities flowing from the monetisation of carbon will affect future competitiveness and market value. Disclosure on carbon strategies, management systems and emissions performance is an effective way to catalyse this understanding within individual businesses and amongst their stakeholders. As a result, KPMG is delighted to be the lead sponsor of the Carbon Disclosure Project South Africa Report 2008.

KPMG is a global network of professional firms providing Audit, Tax and Advisory services. It operates in 145 countries and has 123,000 people working in member firms around the world. KPMG member firms respond to their clients' complex business challenges with a global approach to services that span industry sectors and national boundaries.

For organisations interested in understanding and reducing their carbon impacts, it can be a daunting task to establish a starting point. KPMG sees carbon management as a key business issue and is committed to assisting clients in addressing climate change risks and opportunities. It offers practical business-focused advice by approaching climate change as another element of effective business management and not as an environmental "campaign".

Even though awareness of climate change is only just beginning to gain momentum within South African organisations, KPMG is pre-empting the inevitable requirement for sustainable business practices and is already offering multidisciplinary carbon management services. It is able to draw on a strong multi-disciplinary capability across its sustainability, accounting, tax, corporate finance and business advisory practices to tailor strategies to meet clients' requirements and provide advice from both an environmental and economic perspective.

Its ambitious internal programmes evidence KPMG's commitment to carbon management. Recently the firm announced the launch of the KPMG Global Green Initiative, a tiered global approach aimed at addressing the challenges of climate change. This includes:

- An ambition to reduce combined member firms' carbon footprint by 25% by the year 2010 from a 2007 baseline
- Environmental projects to help address the challenges of climate change within wider commitment to its communities
- Working with its member firms' employees, suppliers and clients to help them improve their climate change impacts

KPMG participates in international bodies that shape the climate change agenda – it is a member of the World Business Council for Sustainable Development (WBCSD) and a founding member of the International Emissions Trading Association.

Shireen Naidoo
Director, KPMG Global Sustainability Services

Frater Asset Management

In May 2006, Frater Asset Management (FAM) became the first asset manager to sign the UN Principles for Responsible Investment (UN PRI). The UN PRI requires investors to incorporate environmental, social and governance (ESG) issues into their investment analysis and decision-making.

The CDP is a global initiative that will encourage companies to improve their environmental disclosure relating to climate change. The project will help provide investors with better information that will lead to better valuations of companies. Better valuations lead to better investment decisions, which in turn lead to better performance on behalf of beneficiaries.

Climate change affects everybody. It is a uniquely serious risk that can affect the sustainability of all business. Long-term investors require information to understand how climate change will affect the companies we are investing in.

The disclosure of climate change risks and the consequent action taken by companies helps position investment managers to invest capital to meet investors' long-term investment objectives. In terms of the UN PRI, investment managers are encouraged to develop an engagement capability. FAM is an active investor and will engage companies to disclose CDP information.

Improving companies' disclosure of this critical issue will build awareness, encourage action, reduce investment risk and help ensure a more sustainable world for society.

David Couldridge
Investment Analyst, Frater Asset Management

Macquarie Group

Macquarie Group (Macquarie) is committed to good corporate citizenship and has been a signatory to the CDP since May 2008. Good corporate citizenship, in the context of climate change, means identifying and managing the various risks associated with it, and developing climate change responses and processes with a strong governance and risk focus. It also means assessing and managing the environmental footprint and providing sustainable products and services to clients and the communities in which it operates.

Climate change raises environmental, social and governance (ESG) issues that Macquarie considers in the normal course of doing business. All Macquarie businesses have an ongoing responsibility to address environmental risks through the operational risk framework, as well as a specific responsibility to consider GHG and energy management systems in the due diligence process for new products or businesses.

While ESG is the collective responsibility of all Macquarie staff, formalised support for ESG matters across Macquarie exists in the following form:

- Macquarie's Board taking an active interest in ESG matters
- Risk management group
- Integrity officers
- Specialist sustainability managers within relevant business groups

Macquarie has a Sustainability and Environment Office, supported by a Sustainability Advisory Committee. The committee makes recommendations to Macquarie's Executive Committee and, depending on the matter or issue, to the relevant Board committees (e.g. Board Corporate Governance Committee, Board Audit and Compliance Committee).

Climate change also presents business opportunities for innovation and investment. Macquarie is working to identify and develop those opportunities, including new investments, trading opportunities and services to clients.

Macquarie's range of responses to the opportunities arising from climate change so far includes Macquarie Capital's acquisition of a 50% interest in the leading energy efficiency and emissions neutralising business, Climate Friendly (Pty) Ltd, and an $1.3 billion investment in renewable energy globally.

Macquarie's Global Climate Change Team has been formed to create and source investment opportunities presented by climate change; and to coordinate Macquarie Capital's energy and carbon activities. Macquarie has also created a Clean Technology Fund, a Carbon Credit Fund and is involved in the European Union's emissions trading, carbon allowance and offset markets. The Macquarie Group Foundation supports grass-roots environmental research and non-governmental organisations (NGOs) through grants, capacity building and staff volunteering.

Dr Duarte da Silva
Director of Macquarie First South (Pty) Ltd

Macquarie First South is a joint venture between First South Financial Services (a member of the J&J Group) and Macquarie Africa (PTY) Ltd (a subsidiary of Australia's Macquarie Bank Limited)

Nedbank Group

As South Africa's "green bank", the Nedbank Group has always pro-actively championed the cause of conservation and environmental sustainability. So, while the direct impact of financial institutions on climate change may be significantly less than that of more emissions-intensive organisations, the Nedbank Group subscribes to the belief that every organisation has a vital role to play in facilitating and promoting environmentally-friendly business operations.

Nedbank has long recognised that environmental management, and particularly the minimisation of its carbon footprint, is a non-negotiable element of the organisation's sustainable corporate performance. The group has been a signatory to the CDP since 2004 and is committed to managing and publicly reporting on its carbon emissions.

It is the belief of the Nedbank Group that the successful reversal of global warming will never result from minimal compliance by industry with legislative or governance requirements. What is required is a global corporate paradigm shift that will see environmental awareness and a commitment to limiting carbon emissions becoming a fundamental part of every organisation's corporate culture. In effect, what is needed to address the crisis of climate change is the adoption of environmentally friendly operations as a core value by organisations in every industry.

By promoting higher levels of disclosure and transparency regarding carbon performance, the CDP is serving to strengthen significantly the case for emissions control as a strategic imperative for all organisations. As such, the Nedbank Group remains committed to supporting the initiative in South Africa and continues striving towards taking a leadership role within the South African financial services industry. It encourages all stakeholders to recognise that they can and must exert a positive influence in the area of climate change, both directly through their own operations and indirectly through the business investments they make.

Selby Baqwa
Chief Governance and Compliance Officer, Nedbank

Executive Summary

This year the international Carbon Disclosure Project (CDP) was extended to include the Top 100 companies on the Johannesburg Stock Exchange (JSE). The sample size has more than doubled since last year's report, which only included the JSE Top 40. The CDP6 (2008) allows for comprehensive insights into corporate climate change awareness and strategies in South Africa. The CDP builds on a reputable process of corporate reporting on climate change and is supported by investors globally, representing more than 385 investors with US$ 57 trillion of assets under management.

Since 2000, the UK-based CDP, on behalf of global institutional investors, has challenged the world's largest companies to measure and report on their carbon emissions, and to demonstrate how the long-term value and cost of climate change has been factored into their investment decisions and growth plans.

This year the global CDP office sent questionnaires to more than 3,000 of the world's largest corporations requesting information on these corporations' greenhouse gas (GHG) emissions, their assessment of the risks and opportunities of climate change, and their strategies for managing these risks and opportunities. The corporations' responses, and the reports assessing the results of these responses, are being published in more than 20 countries, and are freely available at www.cdproject.net.

This CDP6 (2008) South Africa Report, prepared by Incite Sustainability – which partnered with the NBI in bringing the CDP to South Africa – analyses the South African corporate response to the CDP questionnaire that was sent to the Chief Executive Officers (CEOs) of the JSE Top 100 companies. This is the second year that the CDP has been undertaken in South Africa, with the focus last year limited to the JSE Top 40.

The logic of the CDP is simple: a meaningful response to the climate change challenge is dependent upon effective dialogue – between shareholders and corporations, and between businesses, government and NGOs – supported by high-quality information. The mission of the CDP is to facilitate such a dialogue, and to contribute to the provision of quality information from which a feasible and effective regional response to climate change can emerge.

The CDP6 (2008) Questionnaire

The CDP questionnaire is at the heart of the CDP reporting process, defining the information disclosure request to companies. In the light of a continuously growing demand for inclusive carbon reporting and increasing investor awareness, the questionnaire has evolved to capture and assess corporate climate change impacts more comprehensively.

The CDP6 (2008) questionnaire (Appendix 1) focuses on four key areas of corporate climate change management and reporting:

- Climate risks and opportunities
- GHG emissions accounting
- Performance
- Climate change governance

These questions provide companies with an opportunity to identify the strengths and current limitations in different aspects of their management of climate change-related issues. This year, both carbon-intensive and low-carbon companies were invited to respond to all questions included in the CDP6 (2008) questionnaire.

Disclosure Trends in South Africa

- **South Africa's second CDP generated a response rate of 59%.** This compares very favourably with the rate experienced in most other CDP-participant countries. While this is lower than last year's response rate of 74%, the total number of responding companies this year is more than double that of last year.
- **The extended CDP6 (2008) covers the JSE Top 100, of which 60% are new to the CDP.** A third of these new companies submitted a response. The remaining 40% of the JSE Top 100 were exposed to CDP5 (2007), and had a very high response rate of 85% this year compared to 74% last year.
- **Carbon-intensive and low-carbon sectors were equally represented in the sample of responding JSE Top 100 companies.** Compared with last year, there is a good representation of companies within and across most sectors (Figure 1). The insurance and industrial sectors, for example, have a 100% response rate, while the more sizeable metals and mining sector has a 75% response rate. The response rate in some sectors remains

The response rate to South Africa's second CDP is relatively high by international standards and suggests that local companies are largely willing to engage on climate change issues.

Of responding companies, 77% have disclosed their GHG emissions, although in some instances this was only on a partial basis.

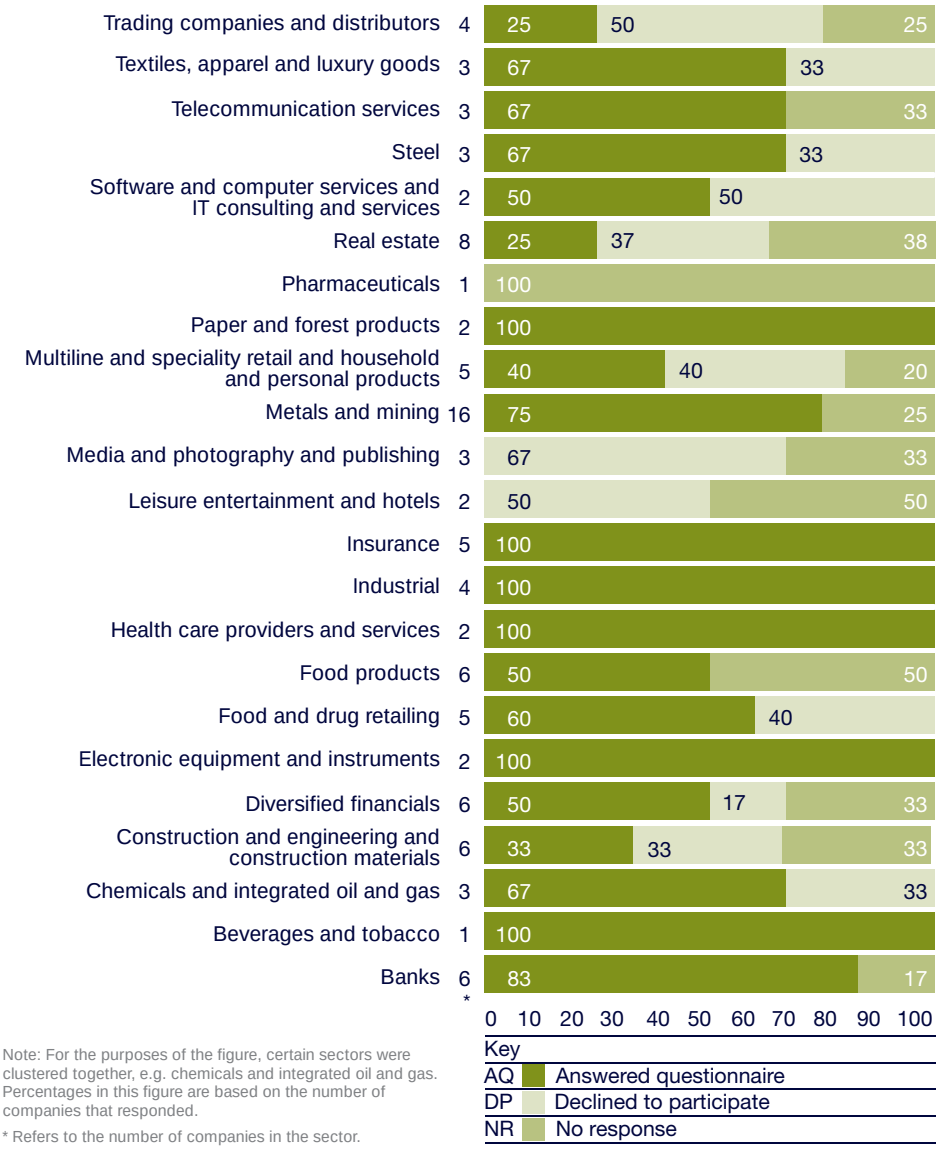
The three largest GHG emitters – Sasol, BHP Billiton and Anglo American – account for two-thirds of the total reported GHG emissions of responding listed companies in South Africa.

The carbon performance of both low-carbon and carbon-intensive companies was significantly impacted by the carbon-intensity of South African electricity supplies, resulting in very high overall "Scope 2" emissions.

disappointing most notably, real estate, leisure, entertainment and hotels; and media, photography and publishing.

- **More than 75% of responding companies disclosed their GHG emissions.** Among the responding companies, 77% disclosed their GHG emissions data, although in some instances this was only on a partial basis. This is an important increase on last year's 57% disclosure rate. The disclosure rate of carbon-intensive companies (88%) was higher than the disclosure rate of companies from low-carbon sectors (69%).
- **Carbon-intensive companies dominate South Africa's disclosed GHG emissions.** The three largest GHG emitters – Sasol, BHP Billiton and Anglo American – account for two-thirds of the total reported GHG emissions of responding listed companies in South Africa. Low-carbon sector companies are responsible for only 3% of the reported 218 million metric tonnes of emissions of carbon dioxide equivalent (CO_2e).
- **Electricity consumption constitutes 41% of the total reported GHG emissions.** The carbon performance of both low-carbon and carbon-intensive companies was significantly impacted by the carbon-intensity of South African electricity supplies, resulting in very high overall "Scope 2" emissions.
- **There is growing awareness among South African companies of the business risks and opportunities associated with climate change.** Most companies believe that the South African government will introduce regulations on climate change in the near future. Many of the responding companies acknowledge that while regulations impose potentially significant risks, they will also level the playing field and hence make efficiency and environmental best practice more attractive. Changing consumer attitude is also seen as possible drivers for carbon-efficient operations. Extreme weather events have been identified as significant growing concern for agriculture, mining operations, logistics and buildings, while many companies have also identified possible risks associated with resource shortages and price increases. Most respondents recognise that climate change may also provide potentially significant business opportunities.
- **Climate change governance in South Africa is largely restricted to emissions accounting.** While most responding companies have developed or are implementing formal systems for measuring and reporting on their GHG emissions, some important gaps remain in emissions management, management execution and dedicated board oversight. Most companies currently lack structured systems for carbon management. Only 23% of the responding companies have specific emissions reduction targets in place. Several responding companies also displayed weaknesses regarding the comprehensive assessment of associated risks and opportunities. This suggests that many companies have not yet fully grasped the management challenges associated with their carbon performance.
- **Companies have started to engage in climate change partnerships.** Acknowledging the possibility of future carbon caps or taxes for South Africa, several companies are beginning to work with government bodies and industry peers on national policies relating to climate change. This is an encouraging improvement on the findings of last year's CDP report. Several companies reported partnerships with NGOs, consultants, and other business organisations to advance their climate change performance.

Figure 1 – JSE Top 100 responses by sector (%)



Note: For the purposes of the figure, certain sectors were clustered together, e.g. chemicals and integrated oil and gas. Percentages in this figure are based on the number of companies that responded.

* Refers to the number of companies in the sector.

Only 23% of the responding companies have specific emissions reduction targets in place.

The South African Carbon Disclosure Leadership Index

- The Carbon Disclosure Leadership Index (CDLI) recognises companies with leading disclosure practices. Ten companies were nominated from both the carbon-intensive and low-carbon sectors. The CDLI scoring methodology (see Appendix 2) applies different expectations for the two sector categories. The scores of low-carbon companies cannot thus be directly compared to carbon-intensive companies.
- BHP Billiton qualified as the overall leader in the carbon-intensive category with 77 normalised points, while Woolworths Holdings qualified as the overall leader in the low-carbon category scoring 95 normalised points (Tables 1 and 2).
- The carbon-intensive CDLI Top 10 reflects the generally high level of carbon disclosure among the metals and mining sector, including six representative companies. The low-impact CDLI Top 10 comprises a wider array of sectors, including three retail companies and three banks.

BHP Billiton (carbon-intensive sector) and Woolworths Holdings (low-carbon sector) qualified as the overall leaders in the CDP6 (2008) Carbon Disclosure Leadership Index.

Table 1 – CDLI leaders – carbon-intensive sectors

Rank	Company	Sector	CDLI Score
1	BHP Billiton	Metals and mining	77
2	Gold Fields	Metals and mining	73
3	AngloGold Ashanti	Metals and mining	72
4	Sasol	Integrated oil and gas	68
5	Exxaro Resources	Metals and mining	64
6	Northam Platinum	Metals and mining	62
7	Anglo American	Metals and mining	59
8	Remgro	Industrial	57
9	Murray & Roberts	Construction and engineering	55
10	Bidvest Group	Industrial	54

Table 2 – CDLI leaders – low-carbon sectors

Rank	Company	Sector	CDLI Score
1	Woolworths Holdings	Food and drug retailing	95
2	Dimension Data Holdings	IT consulting and services	94
3	Massmart Holdings	Multiline retail	90
4	Nedbank Group	Banks	89
5	Pick n Pay Holdings	Food and drug retailing	88
6	SABMiller	Beverages and tobacco	82
7	Medi-Clinic Corp	Healthcare providers and services	76
8	Liberty Life Group	Insurance	73
9	FirstRand Limited	Banks	72
	Standard Bank	Banks	72

Conclusion: Stimulating Business Leadership for Climate Change

In the context of competing social and economic priorities, comparatively high per capita greenhouse gas emissions and high vulnerability to the impacts of climate change, South African policy-makers face a particular challenge in developing a national policy response to climate change and preparing their negotiation position for the post-Kyoto climate regime. Addressing this challenge will require foresight and leadership within both the public and private sectors in South Africa.

This second CDP survey has found encouraging evidence that South African companies are beginning to appreciate and respond meaningfully to this challenge:

- The response rate of 59% compares very favourably with that experienced in most other CDP-participant countries. The relatively high response rate of “low-carbon” companies, which have not faced the same pressures to report, is particularly encouraging.
- There has been a sizeable increase in the number of companies disclosing their GHG emissions. While it is acknowledged that in several instances this disclosure is only on a partial basis, there is nevertheless an evident willingness and commitment to improved monitoring and reporting on greenhouse gas emissions.
- In a significant change on last year’s responses, there appears to be much greater awareness of, and engagement in, government policy on climate issues. This welcome development is due, at least in part, to the government’s Long Term Mitigation Scenarios (LTMS) process, which involved the engagement of numerous senior executives from a range of business sectors.
- In a related development, there is greater evidence of the development of a more collaborative approach to

addressing climate change, with a number of businesses and sector organisations beginning to work together and with other stakeholder groups on climate issues.

Notwithstanding these encouraging developments, there remains room for improvement:

- Relatively few companies have disclosed specific, company-wide GHG emissions reduction targets; and most of those companies that have emissions targets have focused on reducing their emissions-intensity, rather than striving for a reduction in absolute emissions. If South Africa's emissions are to peak and then decline – as is proposed in the government's recently approved climate change vision – then companies will need to demonstrate a significantly higher level of ambition.
- On a related issue, while most responding companies have developed, or are implementing, formal systems for measuring and reporting on their GHG emissions, some important gaps remain in their governance systems for climate change, and in the nature and extent of executive board oversight on this issue.
- It is a concern that some sectors – most notably leisure, entertainment and hotels, media and photography and publishing, and real estate – are very poorly represented in their engagement on climate issues.
- It is evident that South Africa's electricity-generating mix has a profound impact on the majority of corporate emission levels. Without a significant shift in the nature of Eskom's power generation mix, many companies will find it extremely challenging to meet absolute emission reduction targets, notwithstanding their current efforts on energy efficiency.
- Although there have been some encouraging improvements since last year, there is still little evidence to suggest that mainstream South African investors fully appreciate the business implications of climate change, or that they are exerting meaningful influence on the corporate sector on this issue.

This has been an important year in terms of the local and international corporate response to climate change. This is characterised, for example, by the collective call from many of the world's leading companies (including a number of JSE-listed firms) for an ambitious post-2012 climate change policy framework that includes at least a 50% reduction in global greenhouse gas emissions by 2050.

Next year promises to be equally significant, with the focus falling in particular on the deal to be concluded at the UNFCCC meeting in Copenhagen, and on the extent to which developing countries, including South Africa, will commit to adopting emission reduction targets. The development of South Africa's negotiating position in preparation for these talks will require a good understanding of the country's emission levels and of the impact that emissions targets might have on the South African economy. Effective implementation of any agreed strategy will require the active and informed participation of the local business and investment community.

It is hoped that this CDP survey will contribute both to an improved understanding of current emissions levels and of the possible impacts of reduction targets, as well as encouraging the development of further leadership within the South African business sector.

In the context of competing social and economic priorities, comparatively high per capita greenhouse gas emissions and high vulnerability to the impacts of climate change, South African policy-makers face a particular challenge in developing a national policy response to climate change and preparing their negotiation position for the post-Kyoto climate regime.

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Introduction: The Carbon Disclosure Project (CDP)

CDP’s mission is to facilitate a dialogue between investors and corporations, supported by high quality information from which a regional response to climate change will emerge.

Overview

The Carbon Disclosure Project is the largest investor coalition in the world. More than 385 signatory investors, with a combined asset base of $57 trillion, signed CDP's sixth annual request for information in 2008 (CDP6) which was sent to over 3,000 companies worldwide.

The CDP annual information request is sent to the Chair of the Board of the world's largest companies by market capitalisation. It covers four principal areas:

- Management's views on the risks and opportunities that climate change presents to the business.
- Greenhouse gas emissions accounting.
- Management's strategy to reduce emissions/minimise risk and capitalise on opportunity.
- Corporate governance with regard to climate change.

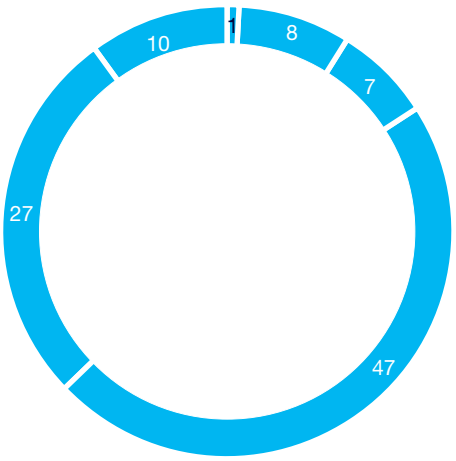
The CDP6 information request can be viewed in Appendix 1.

The responses from companies to CDP's annual requests for corporate data provide investors with vital information regarding the current and prospective impact of climate change on their portfolios, and therefore represents an important resource for investment decisions. The fact that CDP's requests are made on behalf of investors serves to raise the awareness of senior management that climate change is a business issue that requires serious strategic focus.

After eight years of consecutive growth, CDP currently runs projects in more than 20 countries, with new projects launched in China, Korea, Latin America, the Netherlands and Spain in 2008. CDP has also entered into a key strategic relationship with Merrill Lynch and has appointed PricewaterhouseCoopers as its global advisor. These associations will support growth over the next three years.

We are pleased to report that CDP received a record number of company responses to its 2008 annual request – more than 1,550 in total. This demonstrates an increasing understanding by the

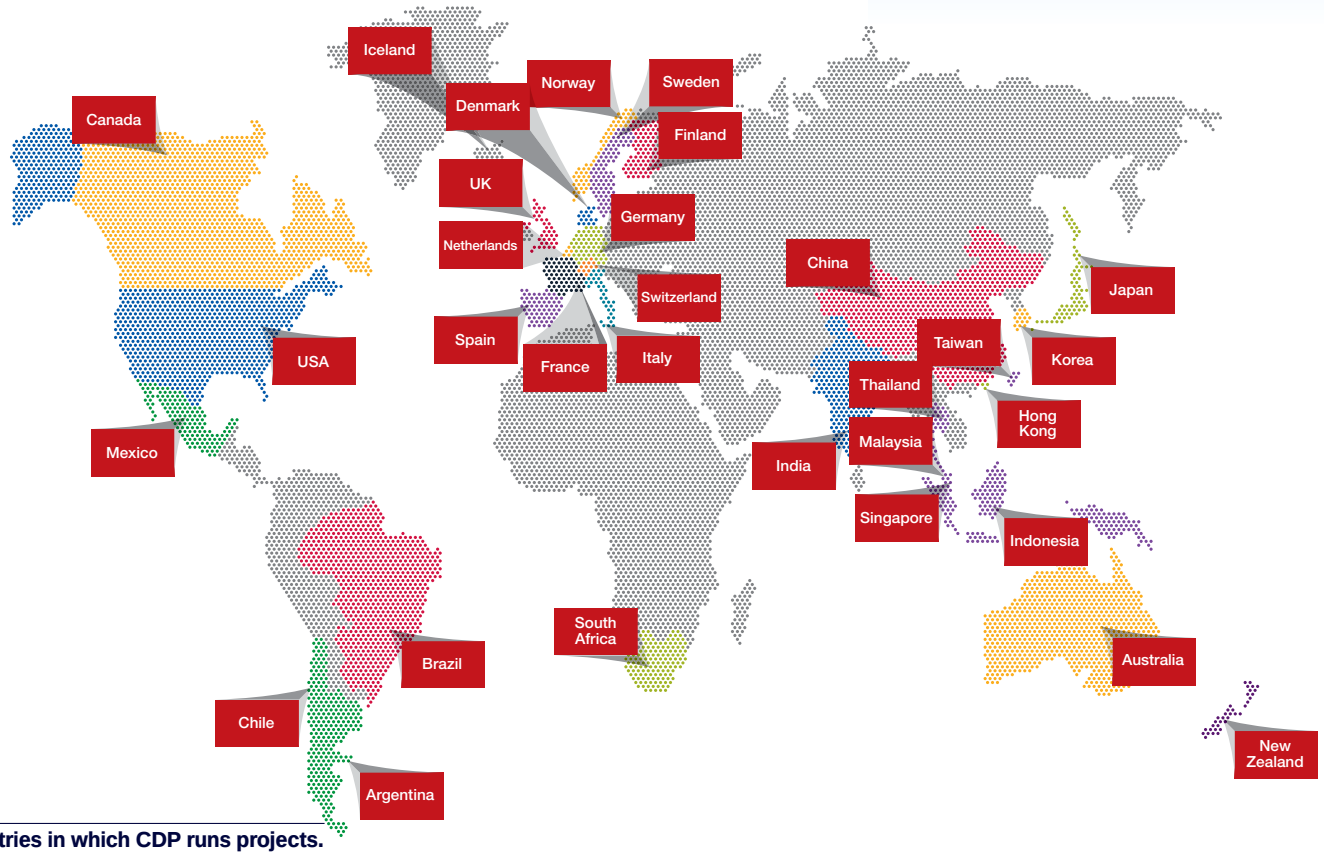
CDP6 Signatory Location by Region



Africa	1%
Asia	8%
Australasia	7%
Europe	47%
North America	27%
South America	10%

"The Carbon Disclosure Project is vital, and we've got to get everybody to participate in it."

Bill Clinton
Former U.S. President



The countries in which CDP runs projects.

"Before CDP we had no comprehensive data on corporate greenhouse gases. But with CDP, policy-makers, investors and companies themselves can take better informed decisions."

Fredrik Reinfeldt
Swedish Prime Minister

"The Carbon Disclosure Project is independent and impartial, it is a clear and transparent mechanism for anyone to see our carbon footprint and to judge our performance at reducing it."

Sir Terry Leahy
Chief Executive, Tesco Plc

"The CDP supports AIG Investments' efforts to assess and analyse trends in risks and opportunities associated with climate change and its mitigation. Climate change continues to be a major financial and investment concern for us and our clients."

Win J Neuger
Chief Executive, AIG Investments

world's largest corporations of the importance of climate change and its relation to business strategy and shareholder value. Analysis of this year's responses shows an advance in greenhouse gas emissions accounting with scope 3, or indirect emissions reporting, registering an increase since 2007.

CDP is currently conducting further research into how investors use CDP data in order to improve their understanding of the investment community's requirements. The results to date show signatory investors using company responses to CDP in:

- Company engagement
- Qualitative checking
- Sell-side research
- The filing of shareholder resolutions
- The creation of new products and indices

This year more than 2,000 additional companies were brought into CDP's system through the new CDP Supply Chain Project. More than 30 companies, including **Tesco, HP, Kellogg** and **Vodafone** now use the CDP system to collect climate change relevant data from their suppliers. This represents a significant achievement by the corporate community, demonstrating how collaboration is key to better understand climate change and its impacts on procurement.

Carbon disclosure has assumed heightened importance on the political agenda and the CDP process has received support from political leaders globally.

Government and public sector organisations also understand the importance of measuring their own carbon risks and emissions. More than 30 cities in the U.S. are currently working together to report through the CDP system – a development that will yield a much better understanding as to how cities are preparing for the low carbon economy. CDP is also working with central and local government departments in the UK including the Foreign and Commonwealth Office and the Office of Government Commerce in HM Treasury, to understand supply chain emissions, risks and opportunities.

CDP acts as secretariat for the Climate Disclosure Standards Board (CDSB), which aims to promote and advance climate change related disclosure in mainstream reports through the development of a global framework for corporate reporting on climate change. This framework will elicit comprehensive, consistent and comparable information for investors, as well as offering greater certainty on disclosure requirements for corporations, and thereby provide an influential model for use by national regulators.

By working with information users, their advisors, regulators and public interest groups, as well as the four leading accountancy majors and the associated accountancy bodies, CDSB aims to support, harmonise and strengthen existing climate change related reporting initiatives and standards. Rather than creating a new standard, the aim is to bring together and enhance current best practice in the form of a single consistent framework that can be used for disclosure in mainstream reports.

Key Trends From CDP Samples Around The World

The sixth iteration of the Carbon Disclosure Project saw even greater expansion than in previous years, with information being requested from over 3,000 companies worldwide.

In 2008 CDP expanded to cover 21 geographical samples (up from 16 in 2007) and 2 sector samples (Electric Utilities and Transport). New geographical expansions in 2008 include China, Korea, Latin America, the Netherlands, and Spain. The corporations' responses and reports analysing findings from these samples will be posted on the CDP website as they are launched worldwide. Please see www.cdproject.net for further details.

Response rates across the vast majority of expansions are above 50% with an average rate of 55%; the highest being the FTSE 100 reporting a 90% (90 companies) response rate. The Brazil 75 came a close second with 83% (60) of companies answering the questionnaire compared to the Global 500 which saw 77% (383) of companies answer the questionnaire. Despite the political hesitancy to take action on climate change within the U.S., responses from S&P 500 companies improved significantly: up from 56% (282) in 2007 to 64% (321) this year. This increase sends a positive message from corporate America, signalling that companies are preparing for the inevitable carbon-constrained economy.

There has been an overall increase in response rates in ten of the samples compared to CDP5; Asia , Brazil, Canada, Electric Utility, France, Germany, Italy, New Zealand, S&P 500 and Transport. The Global 500, FTSE 100/250 and Japan 150 samples reported similar response rates to last year. India was also similar in terms of absolute responses but declined overall due to a doubling of the sample size. Four further samples reported an increase in the absolute numbers of responses but an overall percentage decrease because the sample size was expanded this year: Australia 200, Nordic 190, South Africa 100 and the Switzerland 100.

In some of the emerging economies where CDP has recently expanded such as Asia, China and India there are significant challenges caused by lack of familiarity with CDP amongst companies new to the process, language and cultural barriers, and a lack of regulation on climate change. All contribute to lower response rates from these regions. CDP is working closely with its global partners to overcome these barriers.

"CDP extends its sincere thanks to all of our partners and sponsors around the world for their help in making the CDP process a global success."

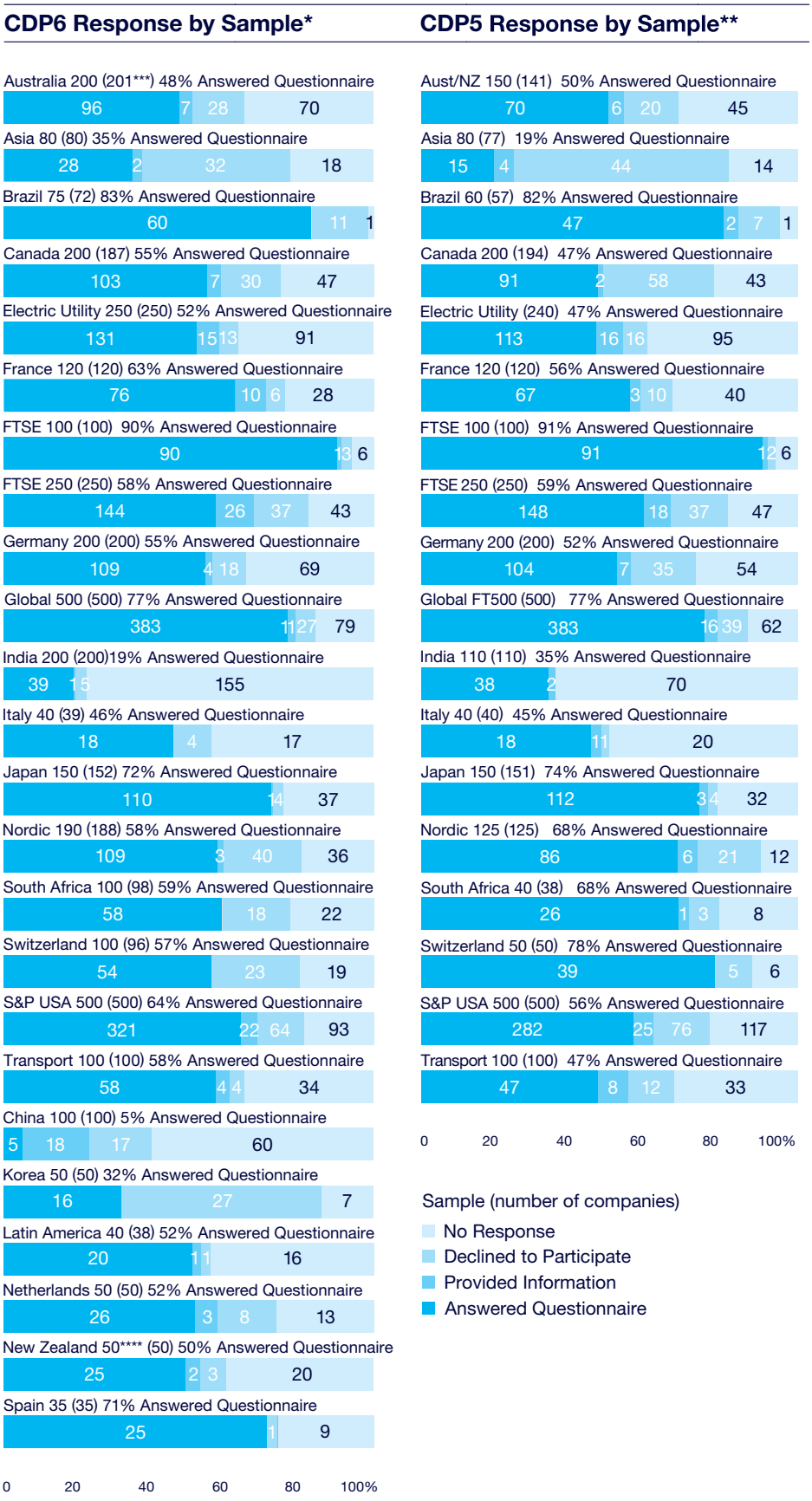
Paul Dickinson
Chief Executive, Carbon Disclosure Project

* Response rates calculated at 31 July 2008, numbers may differ from local report that calculated response rates before or after this date.

** Response rate as published in CDP5 Report.

*** The first listing is the official sample name, the number in brackets is the actual number of companies that were included in CDP6 for that sample.

**** New Zealand is included as an individual sample for the first time, having previously been combined with Australia.



1 Intergovernmental Panel on Climate Change Fourth Assessment Report Climate Change 2007: Synthesis Report Summary for Policy-makers, Geneva, Switzerland, 2007.

2 State and Trends of the Carbon Market (2008), World Bank, Washington DC.

As media coverage of climate change has increased alongside talks of regulatory restrictions, corporations are being given little choice but to consider what climate change means for their business. Compared to CDP5 there has been a sharp increase across nearly all expansions in the percentage of companies addressing climate change at the board level. Especially notable is the increase in board members taking responsibility for climate change. In the FTSE100 companies from 53% (48) to 89% (80), as well as the FTSE 250 expansion's dramatic increase from 24% (35) to 84% (121) of responding companies. For meaningful corporate change to occur, it must come from the board room, and these trends imply that awareness is likely to lead to action.

While the increased focus on climate change can be attributed to a variety of factors, companies are increasingly commenting on the specific risks and opportunities driving new management plans. Both regulatory and physical risks factor heavily into corporate strategy, as can be seen in the key trends table. The Australia 200, Electric Utilities 250, FTSE 100, Japan 150 and Spain 35 expansions are particularly attuned to potential risks from climate change.

The results show a significant increase in the percentage of responding companies that have GHG emission reduction plans. Especially notable are the Nordic 190 sample's increase: from 23% (19) to 62% (68) of responding companies that have reduction plans, and the FTSE 100's progress from 41% (37) to 81% (73) when compared to CDP5. While this increase in attention to climate change targets is a positive step, there is still a need for formal verification of emissions figures and reductions. This will become fundamental as further regulation comes into force and the price for carbon globalises and increases.

Given the significant increase in companies making reduction plans we anticipate that in coming years there will be a subsequent uptake in companies verifying their emissions data.

While the China 100 sample answered questionnaire rate was lowest, it can still be interpreted positively. 2008 was the first time the China 100 was asked to respond to the CDP information request. A variety of factors, including language, cultural differences and a lack of historical requirements on Chinese companies to measure and report climate change information made the initial approach challenging. However the fact that 5% of Chinese companies answered the questionnaire and a further 18% provided information is a promising start and it is likely that the number of responses will grow in the future as CDP develops a presence in China.

CDP6 Global Partner Information*

Country/Expansion	Partner	Web Address
Asia ex-Japan	Association for Sustainable and Responsible Investment in Asia (ASrIA)	www.asria.org
Australia and New Zealand	Investor Group on Climate Change Australia/New Zealand (IGCC)	www.igcc.org.au
Brazil	Brazilian Association of Pension Funds (ABRAPP) and Banco Real	www.abrapp.org.br www.bancoreal.com.br
Brazil	Brazil Facilitation Team: Fabrica Ethica Brasil	www.fabricaethica.com.br
Canada	The Conference Board of Canada	www.conferenceboard.ca
China	China Facilitation Team: SynTao	www.syntao.com
France	AXA	www.axa.com
Germany	BVI Bundesverband Investment und Asset Management e.V/WWF Germany	www.bvi.de www.wwf.de
India	WWF India	www.wwfindia.org
Korea	Korea Sustainability Investing Forum (KoSIF)/Eco-Frontier/ ASrIA	www.kosif.org www.ecofrontier.kr www.asria.org
Latin America	Brazilian Institute of Investor Relations (IBRI)	www.ibri.org.br
Latin America	Latin America Facilitation Team: Fabrica Ethica Brasil	www.fabricaethica.com.br
Netherlands	VROM (The Dutch Ministry of Housing, Spatial Planning and the Environment)	www.vrom.nl
Nordic	ATP, Folksam, KLP and Nutek (Swedish Agency for Economic and Regional Growth)	www.atp.dk www.folksam.se www.klp.no www.nutek.se
South Africa	National Business Initiative (NBI)	www.nbi.org.za
Spain	Ecodes	www.ecodes.org
Switzerland	Ethos/Pictet Asset Management	www.ethosfund.ch www.pictet.com

*All other examples are managed by CDP directly.

3 United Nations Environment Programme, July 2008 – sefi.unep.org/english/globaltrends.

Key Trends

	Number of responses analysed*	% of companies that see regulatory risks	% of companies that see physical risks	% of companies that see regulatory opportunities	% of companies that see physical opportunities
Asia 80	28	71	79	79	71
Australia 200	94	84	82	82	61
Brazil 75	47	49	77	83	57
Canada 200	90	70	63	78	58
China 100	3	33	33	33	33
Electric Utility 250	109	88	77	86	62
France 120	71	60	52	79	56
FTSE 100	88	81	76	80	65
FTSE 250	125	71	66	75	61
Germany 200	94	51	46	68	40
Global 500	384	74	74	80	62
India 200	27	33	70	82	52
Italy 40	17	71	77	82	65
Japan 150	104	90	82	79	64
Korea 50	15	67	93	100	60
Latin America 40	15	73	73	80	60
Netherlands 50	26	64	68	84	52
New Zealand 50	25	72	64	80	60
Nordic 190	109	72	61	81	57
S&P 500	318	60	64	70	50
South Africa 100	53	76	89	85	64
Spain 35	25	84	68	80	56
Switzerland 100	53	45	49	59	45
Transport 100	59	80	81	75	51

	% of responding companies that disclosed GHG emissions data	% of responding companies that had their GHG emissions data externally verified	% of responding companies that have a GHG emissions reduction plan	% of companies that have a Board Committee responsible for CC	% of companies engaged/considering participation in emissions trading**
Asia 80	57	36	54	68	18
Australia 200	78	39	49	73	17
Brazil 75	49	19	43	60	21
Canada 200	70	28	46	72	18
China 100	0	0	66	33	33
Electric Utility 250	70	57	60	75	46
France 120	75	56	75	69	42
FTSE 100	91	71	81	89	41
FTSE 250	65	35	50	84	14
Germany 200	51	3	50	68	33
Global 500	80	57	74	80	35
India 200	41	19	52	52	23
Italy 40	77	65	53	59	53
Japan 150	95	50	90	94	43
Korea 50	67	13	60	80	40
Latin America 40	73	33	47	73	53
Netherlands 50	84	68	64	76	36
New Zealand 50	60	40	48	56	8
Nordic 190	71	42	61	80	28
S&P 500	67	35	53	64	22
South Africa 100	79	30	45	81	21
Spain 35	96	80	76	84	40
Switzerland 100	64	34	53	68	17
Transport 100	71	46	70	85	24

* calculated on 31 July 2008, the number does not include those companies which refer to a parent or subsidiary company response.

** based on their approaches to both EU ETS and other regional and optional emissions trading and offset schemes.

CDP in the future

- CDP is continuously working to improve the quality and quantity of reporting on climate change. CDP is also improving its online reporting system and providing extensive guidance on what should be measured and reported
- CDP will refine its offering to investors through the provision of more bespoke data to service the requirements of individual investment institutions. CDP is also working to expand the availability of its information through professional data distribution channels
- CDP plans to continue its expansion around the globe and aims to launch projects in Russia and other locations in 2009
- CDP has recently launched a new project, "CDP Finance", working with banks to better understand the opportunities, risks and liabilities with relation to climate change across their client base, including the lending and private equity portfolios
- CDP is also developing strategic relationships with a range of organisations to further expand CDP's work and reach in the future
- CDP is working towards a unified global business response to climate change and through its associations with investors, corporations, governments and the other key stakeholders, will continue to help catalyse a sustainable, low-carbon economy.

Improved access to CDP data via CORE

In September 2008 CDP launched the CORE 2.0 database. CORE stands for COrporate REsponses and it is the enhanced access function for presentation and analysis of the CDP data, allowing all the CDP responses to be searched and sorted by index, geography, sector or CDP question. The results are displayed on screen via a web interface and can be downloaded to Microsoft Excel.

CORE 2.0 is designed to enable the user to efficiently manipulate the CDP data to their requirements. The CORE 2.0 system has been built utilising feedback from our signatory members in 2007.

For more information about CORE 2.0 please see www.cdproject.net or contact Daniel Turner at the CDP London office: daniel.turner@cdproject.net

"CDP is one of the most valuable tools we have to help us evaluate climate risk across our whole portfolio."

Brian Rice
Investment Officer, CalSTRS

"The Carbon Disclosure Project is an excellent tool for increasing the exchange of climate information between companies and their institutional investors."

Bendt Bendtsen
Danish Minister for Economic and Business Affairs

"The specialist focus of the Carbon Disclosure Project provides a suitably rigorous structure for an overview of a company's response to climate change, and the survey template is a very helpful management tool for us to assess climate-related risks and opportunities in our own business. It also allows us to benchmark our practices against peers."

Sir Tom McKillop
Chairman, Royal Bank of Scotland Group

CDP remains the world's leading proponent of climate change and carbon disclosure, with a strong and growing history of corporate disclosure through its annual questionnaires and its database of corporate responses.

The scientific and economic imperative for a bold response to the threat of climate change is clear.

The CDP6 (2008) South Africa Report: Objectives

The CDP6 (2008) South Africa Report has five key objectives, to:

- Provide institutional investors and other stakeholders with information that facilitates a better understanding of the risks and opportunities stemming from climate change.
- Highlight best practice in activities to address climate change across a range of sectors.
- Benchmark action and disclosure between different companies and sectors.
- Analyse key issues in relation to climate change disclosure and to comment on differences in responses on a sector-by-sector basis.
- Use companies' responses to CDP6 as a way of identifying key concerns, challenges and future directions around carbon disclosure and broader corporate sustainability practice.

The CDP6 South Africa report is split into seven main sections:

- **Section 1** (this section) introduces the CDP and briefly outlines key trends from the CDP responses globally.
- **Section 2** provides an overview of recent developments in the climate change arena, noting key policy developments internationally and in South Africa, and reviewing recent findings on the potential physical implications of climate change for South Africa.
- **Section 3** provides an overview of the response rate of the South African JSE Top 100 to the CDP and presents the results of the Carbon Disclosure Leadership Index.
- **Section 4** presents the bulk of the analysis of the JSE 100 responses, assessing the nature of the corporate response to climate change, and reviewing current levels of disclosure on greenhouse gas emissions.
- **Section 5** provides a brief case study of Eskom's approach to climate change, based on their voluntary submission to the CDP.
- **Section 6** offers some general perspectives on the business implications of climate change, as provided by the sponsoring organisations to the South African CDP.
- **Section 7** provides a closing commentary on the CDP report, provided by World Wide Fund for Nature South Africa (WWF-SA).

The analysis and information provided in this report is complemented by a comprehensive on-line database of global responses to the CDP questionnaires covering the past six years. Experience has shown that a wide range of stakeholders, from investors through to corporations, policy-makers, consultants, non-profits and academics, use these reports.

2

International and National Climate Change Developments

This section reviews recent policy developments on climate change – internationally and nationally – and provides an overview of the potential physical implications of climate change for South Africa.

"The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) has provided a strong scientific basis and rationale for timely action to stabilise the earth's climate.

Failure to do so could lead to very serious impacts of climate change, which have been assessed for different sectors and regions in the world.

At the same time the cost of stringent mitigation has been found to be modest and the co-benefits from such actions immense.

Scientific knowledge of climate change, therefore, requires urgent mitigation action by human society as an imperative."

RK Pachauri
Director General, The Energy and Resources Institute (TERI) and Chairman, Intergovernmental Panel on Climate Change (IPCC)

Climate change remains high on the agenda

The intervening year since the results of CDP5 were published in September 2007 has been eventful with important developments in climate science, climate change policy and the carbon markets.

Since the last CDP report, **climate science** has become more certain, and also more worrying. The latest assessment of the science was presented by the Intergovernmental Panel on Climate Change (IPCC) in late 2007. The IPCC's Fourth Assessment Report, which involved over 2,500 scientists and reviewers from 130 countries,[1] concluded that warming of the climate system is unequivocal and that it is more than 90% certain that it is caused by human activity.

The report projected possible average temperature rises of between 1.1°C – 6.4°C by 2100, more extreme weather events and increased stress on various global systems including agriculture, water, and transport and energy infrastructure, with the threat of abrupt or irreversible impacts. In recognition of their efforts, the IPCC was awarded the Nobel Peace Prize jointly with Al Gore.

Global climate change policy also moved forward on a number of fronts. The UN meeting in Bali in December reached agreement on a new negotiating mandate for a successor treaty to the Kyoto Protocol. The "Bali Roadmap" aims to finalise a new climate treaty by December 2009 in Copenhagen. The roadmap is a collection of initiatives and decisions around key areas such as climate change mitigation and adaptation, technology transfer and financing.

The roadmap also includes consideration of quantified targets by developed countries (which given its recognition of the IPCC's work could mean deep reductions on 1990 levels), as well as mitigation actions by developing countries.

The last year has also seen some important policy developments at a regional and country level. Following the election of Kevin Rudd, the new premier in **Australia**, that country moved quickly to re-engage in international climate change policy and ratify the Kyoto Protocol. The Rudd administration is now working on the design of a national, multisectoral emissions trading scheme which could be operational by 2011. In the **United States**, there have been a number of bi-partisan proposals to the U.S. Senate for firm carbon targets and State-level initiatives, such as the Regional Greenhouse Gas Initiative (RGGI) now being implemented. Meanwhile, in **Europe**, the European Commission released proposals in January 2008 to strengthen the EU's response to climate change including an update of the EU Emissions Trading Scheme (EU ETS) in time for Phase 3 of the Scheme which will start in 2013.

Carbon markets saw continued, dramatic growth over the year. Traded volumes in the EU ETS grew strongly, with an estimated two billion metric tonnes traded in 2007 – a year-on-year increase of over 85% – representing a value of around €37 billion.[2] Transaction activity in the project-based carbon credits market was also up, with the market worth around €10 billion; the majority of this was accounted for by Certified Emissions Reductions (CERs) under the Clean Development Mechanism (CDM). The market expects this growth to continue, up to and beyond 2012, with the expansion of the EU ETS and new carbon markets expected to come on stream in the U.S., Japan and Australia over the next couple of years. Furthermore, the market is beginning to mature with a greater understanding of how to price carbon risk and increasing product sophistication.

1 Intergovernmental Panel on Climate Change Fourth Assessment Report Climate Change 2007: Synthesis Report Summary for Policymakers, Geneva, Switzerland, 2007.

2 State and Trends of the Carbon Market (2008), World Bank, Washington DC.

The last year has also seen more **corporate engagement** in the climate change agenda, with many leading companies taking active and public stances on climate change. Although companies are increasingly concerned about the impacts on markets and regulation, as well as the physical impacts of climate change, the focus for many companies is the very real and immediate opportunity that climate change presents, through new and changing markets, new technology and the transition to a low carbon economy.

Consumer awareness has also increased, driven by the intensive media coverage of the issue and concerns about high energy prices. Whether this is leading to any significant and sustained changes in consumer behavior is harder to assess, although there is evidence that some consumer groups in the U.S. and Europe are starting to factor carbon and wider environmental impacts into spending decisions, whilst high energy prices are having an impact more widely in some product markets (e.g. energy efficient vehicles and home appliances). Many companies in the Retail and Consumer sectors are responding to these developments with increased environmental information on companies and products, green marketing and new low-carbon products.

Clean technology markets had mixed fortunes. Much has been written about the complex sustainability interactions around biofuels, but the sector has faced more straightforward cost issues over recent months due to the surge in prices for global agricultural commodities. Many alternative energy technologies have benefited from technological innovation, improved efficiencies and economies of scale in production and deployment – however, high commodities prices and supply chain bottlenecks have impacted on more established sectors such as biofuels.

Nonetheless, the clean tech sector globally attracted US$148billion of investment during 2007, with a large majority of this U.S. based and focused on large-scale solar, biofuels or transportation solutions.[3] Within Europe, there is renewed interest in tidal technologies and the value chains around carbon capture and storage are attracting increasing interest globally, with a number of new pilot and demonstration projects emerging. While there is much debate over the "green" credentials of nuclear power, there also appears to be increasing momentum towards more investment in new facilities in Europe and the U.S. for reasons of both energy security and carbon reduction.

The continuing focus of policy-makers, businesses, NGOs and consumers on climate change has turned the heat up on **corporate reporting and disclosure** around climate change and carbon. The expansion of emissions trading is requiring more and more companies to measure and report their emissions; but pressure for disclosure goes beyond carbon, with a number of leading institutional investors standing alongside environmental NGOs to call for mandatory reporting of climate change risks. Many leading companies are also embracing more comprehensive disclosure, with a number of initiatives in the retail and consumer sectors in particular driving the reporting imperative down the supply chain, e.g. CDP's Supply Chain Project.

CDP remains the world's leading proponent of climate change and carbon disclosure, with a strong and growing history of corporate disclosure through its annual questionnaires and its database of corporate responses (the world's largest repository of corporate climate change information). At the same time it is seeking to broaden the reporting agenda, through leadership and innovation in this important area.

Looking forward to 2009

2009 is set to be a defining year in the climate change calendar. Much rests on the outcome of the Copenhagen Climate Conference in December 2009. The outcome of this conference is likely to shape the policy response for the next decade and, potentially, the speed and severity of climate change impacts for many decades to come.

"Copenhagen must produce a fully workable action plan to meet head-on the biggest challenge we have ever faced as a civilisation. Global warming is a problem with major ramifications, there are plenty of solutions to hand, and the need to decarbonise our economies will create new challenges for innovation from the private sector. This will stimulate economic growth in a new sustainable direction fit for the twenty first century."

Professor Sir David King
Director,
Smith School of Enterprise and the Environment
Oxford University

3. United Nations Environment Programme: July 2008 – sefi/unep.org/english/globaltrends.

CDP remains the world's leading proponent of climate change and carbon disclosure, with a strong and growing history of corporate disclosure through its annual questionnaires and its database of corporate responses.

The scientific and economic imperative for a bold response to the threat of climate change is clear.

Policy-makers in Bali have set the agenda, but much needs to be done in the next twelve months to turn their ambition into a reality. The scientific and economic imperative for a bold response to the threat of climate change is clear. But the political challenge is as great as ever, in particular, how to reconcile the economic growth goals of developing nations with the desire for deep cuts in GHG emissions, and how to galvanise the investment necessary to create the pathway to a low-carbon economy in a year when many of the leading economies of the world are confronting the possibility of a sustained economic downturn.

The Road to Copenhagen

Much was made in the press of the irony of hundreds of government officials, business and NGO representatives converging on the delightful Pacific island of Bali for a major UN climate conference last December, despite the fact that the island was chosen to highlight the carbon impact of deforestation in the developing world. The objective of the meeting was to reach agreement on a new negotiating mandate for a successor treaty to the Kyoto Protocol which expires in 2012.

So what was actually achieved? In essence, the "Bali roadmap" sets an agenda for negotiations with the aim of finalising a new climate treaty at the 15th Meeting of the Conference of the Parties in Copenhagen in December 2009. The roadmap is a collection of initiatives and decisions around key areas such as climate change mitigation and adaptation, technology transfer and financing. Furthermore, the roadmap includes consideration of quantified targets by developed countries as well as mitigation actions by developing countries.

What's on the agenda?
Climate negotiations, like glaciers, tend to move slowly. The negotiations in the lead up to, and during the Copenhagen meeting are complicated by a twin track approach involving matters related to the UN Convention and the Kyoto Protocol. Significantly, the first group includes all developed and developing countries, while the second looks only at potential further commitments for developed countries that are signatories to the Protocol (i.e. not the U.S.). There is the assumption or hope that these two tracks will link by the time the negotiations reach Copenhagen.

The key issues being addressed can be summarised as follows:

Long-term and interim targets: a global, long-term target (such as for 2050) sets the overall level of ambition and needs to be driven by scientific consensus on expected carbon concentrations and their likely effects. Interim targets are important since they provide a path towards the overall goal and assist business in framing investment decisions. In both cases, there will be a need for agreement on the form of the target (e.g. percentage, absolute reduction) and the base year; 1990 tends to be the default but others are possible. The Bali agreement footnoted the IPCC report that states the level of reductions that are needed, which could be an indication of the targets to be agreed.

Measures for developed countries: industrialised nations will need to show leadership in taking on new, binding, carbon commitments. Under Kyoto and the EU ETS, countries have adopted individual targets which together form an aggregate level of emissions reduction (such as the 5% target under Kyoto or 8% under the EU ETS). In Bali, some developed countries proposed reductions in the range of 25-40% by 2020 (as indicated by the IPCC) as guidance for the level of ambition, but this in itself is a wide range. A crucial factor here will be the extent to which emission reductions need to be achieved "at home" as opposed to through the purchase of carbon credits from developing economies.

Measures for developing countries: effective participation of developing countries is crucial if real action on climate change is to

occur. Whilst binding targets are not on the agenda, some form of agreed action plans supported by collaborative initiatives (financial and technology transfer) and access to global carbon markets are likely to emerge. There is recognition, however, that developing countries are not a homogenous group and debate is likely around the appropriate differentiation within the group – and when the transition occurs from "developing" to "developed".

Technology and finance for sustainable development: the role of technology is critical in achieving any carbon targets and there is a need for complementary policies and cooperation to support technology development and deployment. A sufficiently long horizon for the price of carbon should provide a stimulus, but the Copenhagen discussions will also consider the extent to which multilateral co-operation can be effective in transferring technology (especially in the areas of energy efficiency and cleaner power generation) to developing countries and how this should link with other areas such as foreign assistance programs and trade policy.

Sectoral approaches: to date, the international discussion around carbon targets has very much been focused on actions taken by sovereign states. Other variants are clearly possible, however, and one option that is receiving increased attention is international sector agreements, although this is considered controversial. Advocates argue that agreeing targets at a sector level would ensure comparability of effort between developed and developing countries and level the playing field for industries (such as steel, cement and others) that are exposed to high levels of global competition.

Role of forestry: the Bali roadmap included a decision to establish incentives to stop deforestation – which results in emissions roughly equivalent to those from the global transportation sector. The exact form of this is still uncertain; for example, the role of forestry in the global carbon markets and whether avoided deforestation should be eligible for carbon credits. Alternatively, initiatives could take the form of capacity building in-country with funding programs to support reforestation and improved forest management.

Other climate initiatives
In response to the frustration of dealing with the complexity of the UN climate negotiations and the fact that all decisions have to be agreed by consensus (between 190 countries), some countries have proposed other international initiatives on climate change. Some of these recognise the supremacy of the United Nations Framework Convention on Climate Change (UNFCC), others do not.

The Asia Pacific Partnership (APP) was formed shortly after the Bush administration outlined its concerns over the Kyoto Protocol. APP partners including Australia, Canada, China, India, Japan, Republic of Korea, and the United States have agreed to work together, and with private sector partners, to meet goals for energy security, national air pollution reduction, and climate change in ways that promote sustainable economic growth and poverty reduction.

The G8 has also taken steps to fast track the climate change negotiations by engaging directly with key developing nations. At Gleneagles in 2005 the G8 agreed to a Dialogue on Climate Change, Clean Energy and Sustainable Development; more recently, at Hokkaido in July 2008, the G8 stated the ambition of halving carbon emissions by 2050. A range of specific actions are listed from improving efficiency of household appliances to reducing associated gas flaring. A wider group, known as the G20, made up of G8 countries plus some developing countries, meets periodically to discuss progress towards the Gleneagles Plan of Action.

The Copenhagen Protocol?
The Bali roadmap does not specify explicitly what the emissions targets should be or who will take them on – those discussions will probably take place in the last days of COP-15 in Copenhagen. A new protocol could include emissions targets for developed countries and specific actions by some developing countries, sector-based approaches or goals, incentives to reduce deforestation and the framework for market mechanisms to support these goals. It is often stated at UN climate negotiations that "nothing is agreed, until everything is agreed", i.e. it is not possible to conclude negotiations on one issue ahead of the others. Agreement on targets, technology transfer, adaptation, forests and financial mechanisms are all tied together. Given that momentum at these meetings ebbs and flows, we are unlikely to see significant progress (e.g. a negotiating text) by the end of the next climate summit at COP-14 in Poznan, Poland, in December this year. It won't be until the closing days of the Summit in Copenhagen in 2009 where the nature and ambition of the next global climate treaty will be realised.

A new protocol could include emissions targets for developed countries and specific actions by some developing countries, sector-based approaches or goals, incentives to reduce deforestation and the framework for market mechanisms to support these goals.

Recognition of the need for measures to adapt to climate change has become a more prominent feature alongside mitigation in the international climate change discourse.

Climate Change in South Africa: Adapting to the Physical Impacts

In 2004, the world produced about 49,000 Mt CO_2e, mainly from energy generation and deforestation. In comparison South Africa produced about 440 Mt, or about 1% of the global figure.[1] Although small in global terms, South Africa's GHG emissions are large relative to its population and economy. The country's emissions intensity (GHG emissions per unit of GDP) is high compared to most developed and developing countries, while emissions per capita (GHG emissions per person) are higher than China and India, which are also both coal-based energy economies.

South Africa's relatively high GHG emissions, coupled with its need for economic growth and development, provides policy-makers with a tough conundrum. To achieve the UN Millennium Development Goals, the South African government needs to halve poverty and unemployment by the year 2014.[2] This will require an average minimum economic growth rate of 6% between 2010 and 2014, accompanied by massive infrastructure investment in the areas of power generation and distribution, rail, harbours and an oil pipeline.[3] At the same time, Southern Africa has been identified as one of the regions that is potentially most vulnerable to the impacts of climate change.

To promote economic development, and yet not undermine its benefits through increased climate change, South Africa will need to increase its energy production to meet its growth requirements, while at the same time decarbonising the economy as part of global efforts to minimise the adverse effects of a changed climate. To achieve this it will need to significantly reduce its energy intensity, as well as rely on alternative forms of power generation, including nuclear, natural gas and various forms of renewable energy.[4]

Adapting to a Changing Climate

The extent to which GHG emissions are reduced now will determine the severity of the potential climate change impacts in the future. However, even if all emission-generating activity were to halt immediately, the earth is still likely to undergo unavoidable climate shifts. Recognition of the need to adapt to climate change has thus become a more prominent feature alongside *mitigation* in the international climate change discussion.

Recent studies have suggested that climate change could have serious impacts on many sectors of the South African economy, with the areas of highest vulnerability being the health sector, maize production, plant and animal biodiversity, water resources and rangelands.[5]

One of the most significant concerns relates to the potential changes in the availability and quality of water resources in South Africa, with possibly profound implications for the national economy. Water quality and availability is already seen to be a limiting factor to economic growth and development, and it is anticipated that this could worsen dramatically. Other research suggests that maize production could drop substantially with similarly significant impacts on the South African economy. Should there be no adaptation to climate change, studies indicate a potential drop in net agricultural revenues in South Africa of as much as 90% by 2100.[6]

The incidence of malaria, already the 11th highest cause of deaths globally (90% of which occur in sub-Saharan Africa) is likely to increase due to the expansion of conditions that are favourable to the disease.[7] Significant changes to local ecosystems are anticipated, with the fynbos and succulent Karoo biomes predicted to experience losses of 50-60% by 2050.[8] In the marine sector, the increase of algae and dinoflagellates during warming could increase the number of people affected by toxins from consumption of marine food with resultant effects on the fishing industry.[9] The recent decline in fish stocks off the Namibian coast has been attributed to climate change.

1 DEAT Long Term Mitigation Scenarios: Strategic Options for South Africa (October 2007).

2 Unemployment reduced to below 15% and poverty rate to less than 1/6th of households.

3 ASIGSA.

4 The Department of Minerals and Energy (DME) has set a target of increasing renewable energy to 10,000 gigawatt-hours by 2013, and a bio-fuels industry strategy has been finalised to elevate the role of bio-fuels in South Africa. The DME is finalising a Nuclear Energy and Technology Strategy that will include provision for a nuclear base-load similar to Koeberg as well as small to medium-sized power plants.

5 Kiker, G.A., 2000. South African Country Study on Climate Change: Synthesis Report for the Vulnerability and Adaptation Assessment Section, Draft Paper – School of Bioresources Engineering and Environmental Hydrology, University of Natal.

6 Benhin in 2006 in IPCC, 2007.

7 Kiker, 2000.

8 Midgley et al., 2002 in IPCC, 2007.

9 Union des Comores, 2002 in IPCC 2007.

10 For more detailed discussion see IPCC, Working Group II, Impacts, Vulnerability and Adaptation, Chapters 17 and Glossary, www.ipcc.ch.

11 See for example Burton, I., Diringer, E. and Smith, J., 2006: Adaptation to Climate Change: International Policy Options, Pew Centre, Global Climate Change.

Although South Africa is particularly vulnerable to climate change, the country has access to greater resources and capacity to adapt than most of its neighbouring countries. The aim of adaptation strategies is to reduce vulnerability caused by current climate change conditions and to provide protection against projected future changes, together with developing any new opportunities that may arise from climate change's beneficial effects.

Whilst large transaction costs are associated with adaptation, these should be weighed against the risks of maintaining a business-as-usual scenario.

Although vulnerability to the physical effects of climate change varies across business sectors, all sectors may be exposed to property damage, as well as to disruption of services and business activities associated with possible damage to infrastructure and utilities.

Climate Change Adaptation and the Private Sector – Challenges and Opportunities

Guest contribution by Professor Colleen Vogel (Wits University)

Climate change adaptation, as defined by the Intergovernmental Panel on Climate Change (IPCC), includes the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." Adaptation can be both proactive (planning ahead of time) or reactive (responding to impacts or change).[10]

Adaptation to climate change can include:

- Technological adaptation – such as improved storm-water drain design and weather-resilient crops
- Reducing exposure to future climate risks – for example, by avoiding developments in flood-prone areas
- Social adaptation – for example, by expanding information networks (such as improved information flow between weather bureaus, local business, communities and disaster management agencies), knowledge sharing and skills development
- Improved risk assessment measures – that provide for increased climate variability (particularly relevant for the insurance industry)
- Institutional adaptation – this could include, for example, greater alignment of the activities of government departments so as to improve early warning and disaster management systems

To be successful and as cost-effective as possible, adaptation priorities should be integrated across the full breadth of economic and development decision-making efforts and structures.[11]

The business community's engagement with the wider climate change agenda is currently focused largely on mitigation. Despite the concerted efforts of a handful of companies, adaptation measures amongst the private sector are still very diffuse.

This may be because the scientific and business communities have been slow to engage with each other and find the "low-hanging fruit" amid the uncertainty and complexity that characterises climate science. On the other hand, progress may also have been hampered by governments' reluctance to take the lead through legislative or other policy measures on adaptation.

Some of the companies most vulnerable to climate change include those with strong links to water, agriculture and biodiversity, such as the mining, energy, food production and tourism sectors. Most of these sectors are particularly sensitive to resource pressures; climate change and variability may therefore aggravate already strained resources.

One of the key ways in which business could assist in adaptation is by taking a proactive interest in the wider adaptation agenda. This could include providing support to scientists, government and the development community by finding the means to review current business activities effectively in the light of climate risks. On a practical level this means, for example, thinking through how an extreme rainfall event would affect business operations.

Business could also integrate climate issues within their existing corporate social investment (CSI) initiatives with the aim of enhancing the climate resilience of ecosystems and societies. For example, if a company builds a school as part of its CSI programme, it should build in additional resilience to make sure that it can withstand extreme weather events.

The first step forward by business on adaptation to climate change is to start proactively engaging with scientists, governments and civil society on the matter to ensure a synergetic outcome of efforts.

The South African government has recognised the need to match developed-country emission reduction commitments with a commitment of its own. Relying on its developing country status to press for a total exemption from mitigation effort is no longer seen to be a feasible option for South Africa.

The South African Policy Response: Mitigating Climate Change

South Africa has ratified the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, and has played an active role in the international climate negotiations. As a developing country, South Africa is currently exempt from adopting mandatory emissions reduction targets. In terms of the Kyoto Protocol's first commitment period (2008-2012), carbon constraints were imposed only on industrialised countries. The nature of the climate policy regime after 2012 is the subject of continuing negotiation, with agreement on this issue anticipated at the 15th meeting of the Conference of the Parties to be held in Copenhagen in December 2009 (see pages 14-15). It is expected that this "post-Kyoto" climate deal will include emissions reduction commitments for at least some developing countries.

Following its ratification of the UNFCCC and the Kyoto Protocol, South Africa began the process of developing a national climate change policy under the auspices of the National Committee for Climate Change (NCCC), an advisory body established by the Department of Environmental Affairs and Tourism (DEAT). The resulting *National Climate Change Response Strategy for South Africa* was published in September 2004. At its 52nd National Conference in Polokwane in 2007, the governing African National Congress (ANC) further signalled government's resolve to seriously address the challenge of climate change, with a resolution calling for a target to be set to reduce GHG emissions.[12]

Preparing SA for a "post-Kyoto" Climate Regime: The Long Term Mitigation Scenarios (LTMS) for Climate Change

The South African government has recognised the need to match developed-country emission reduction commitments with a commitment of its own. Relying on its developing country status to press for a total exemption from mitigation effort is no longer seen to be a feasible option for South Africa.[13] Policy-makers recognise that if the serious regional impacts of climate change are to be avoided, then large developing country emitters – such as China, India, Brazil and South Africa – will need to join developed countries in adopting emissions reduction targets.

As a result of South Africa's high relative levels of GHG emissions (both on a per capita and GDP basis), the country is in a difficult position in relation to some of the proposed post-Kyoto climate regimes. Based on equity, some countries argue that national emission allowances should be allocated on a per capita basis; South Africa already exceeds the global average. Others have suggested a regime based on emissions intensity, which would also have significant implications for South Africa. A third approach (the "Brazilian Proposal") suggests a different approach to equity, allocating emissions based on historical responsibility for temperature change.[14]

In the context of these challenges, South Africa understands the need to prepare carefully for the forthcoming climate negotiations; its negotiating position should be based on a full understanding of the potential emissions reduction and cost implications of different mitigation options. What actions should South Africa take? When should emissions begin to decline? And how fast?

12 ANC 52nd National Conference 2007 – Resolutions; www.anc.org.za/ancdocs/history/conf/conference52.

13 DEAT Long Term Mitigation Scenarios: Strategic Options for South Africa (October 2007).

The answer to these questions is to assist the South African government to develop policy and to prepare clear positions for post-2012 negotiations. The South African Cabinet commissioned the LTMS process. The first phase of the LTMS study was completed in October 2007. A Scenario Building Team, comprised of strategic thinkers from government, business and civil society working with four research teams, produced a scenario document and a more detailed technical summary. The outcomes of the study were presented to leaders from government, business and civil society in late 2007, with a final version of the findings and recommendations of the LTMS study presented to cabinet in July 2008. Based on its consideration of this study, the government released a statement on 28 July 2008 outlining its vision, strategic direction and policy framework for climate change (see page 20).

The government's stated vision includes an explicit commitment to introducing a legislative, regulatory and fiscal package, including ambitious and mandatory energy efficiency targets, an escalating CO_2 tax, and mandatory national targets for the reduction of transport emissions, including aggressive promotion of hybrids and electric vehicles.

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14 As outlined in a media statement by Minister Marthinus van Schalkwyk following a Cabinet Lekgotla in July 2008. A transcript of the speech is available at www.info.gov.za/speeches/2008/08072816451001.htm.

South African Government's Vision for Climate Change

Government has outlined its vision for climate policy in the following terms:[15]

- In designing our policy for the transition to a climate resilient and low-carbon economy and society, we will balance our mitigation and adaptation response.
- Our climate response policy, built on six pillars, will be informed by what is required by science, namely to limit global temperature increase to 2°C above pre-industrial levels. The six policy direction themes are:
  - Theme 1: Greenhouse gas emission reductions and limits
  - Theme 2: Build on, strengthen and/or scale up current initiatives
  - Theme 3: Implementing the "Business Unusual" call for action
  - Theme 4: Preparing for the future
  - Theme 5: Vulnerability and adaptation
  - Theme 6: Alignment, coordination and cooperation
- We will continue to proactively build the knowledge base and our capacity to adapt to the inevitable impacts of climate change, most importantly by enhancing early warning and disaster reduction systems and in the rollout of basic services, water resource management, infrastructure planning, agriculture, biodiversity and in the health sector.
- GHG emissions must peak, plateau and decline. This means it must stop growing at the latest by 2020-2025, stabilise for up to ten years and then decline in absolute terms.
- Over the long term, we will redefine our competitive advantage and structurally transform the economy by shifting from an energy-intensive to a climate-friendly path as part of a pro-growth, pro-development and pro-jobs strategy.
- Implementing policy under six themes will lay the basis for measurable, reportable and verifiable domestic emission reduction and limitation outcomes.
- Overall, this would constitute a fair and meaningful contribution to global efforts. We would demonstrate leadership in the multi-lateral system by committing to a substantial deviation from baseline, enabled by international funding and technology.

Mitigation strategy

With reference specifically to our mitigation strategy, cabinet adopted the following approach:

- *The Start Now* strategic option as outlined in the LTMS will be further implemented. This is based, amongst others, on accelerated energy efficiency and conservation across all sectors, including industry, commerce, transport and residential, inter alia through more stringent building standards.
- We will invest in the *Reach for the Goal* strategic option by setting ambitious research and development targets focussing on carbon-friendly technologies, identifying new resources and affecting behavioural change.
- Furthermore, regulatory mechanisms as set out in the *Scale Up* strategic option will be combined with economic instruments such as taxes and incentives under the *Use the Market* strategic option, with a view to:
  - Setting ambitious and mandatory (as distinct from voluntary) targets for energy efficiency and in other sub-national sectors. In the next few months, each sector will be required to do work to enable it to decide on actions and targets in relation to this overall framework.
  - Based on the electricity crisis response, government's energy efficiency policies and strategies will be continuously reviewed and ambitious national targets aligned with the LTMS.
  - Increasing the price of carbon through an escalating CO_2 tax, or an alternative market mechanism.
  - Diversifying the energy mix away from coal, whilst shifting to cleaner coal – for example by introducing more stringent thermal efficiency and emissions standards for coal-fired power stations.
  - Setting similar targets for electricity generated from both renewable and nuclear energy sources by the end of the next two decades.
  - Laying the basis for a net zero-carbon electricity sector in the long term.
  - Incentivising renewable energy through feed-in tariffs.
  - Exploring and developing carbon capture and storage (CCS) for coal-fired power stations and all coal-to-liquid (CTL) plants, and not approving new coal-fired power stations without carbon capture readiness.
  - Introducing industrial policy that favours sectors using less energy per unit of economic output and building domestic industries in these emerging sectors.
  - Setting ambitious and, where appropriate, mandatory national targets for the reduction of transport emissions, including stringent and escalating fuel efficiency standards, facilitating passenger modal shifts towards public transport and the aggressive promotion of hybrids and electric vehicles.

Process Going Forward: 2009 to 2012

Cabinet has mandated a clear path for the future. Milestones will include a national summit in February next year, the conclusion of international negotiations at the end of 2009, and a final domestic policy to be adopted by the end of 2010 after international negotiations have been completed. The process will culminate in the introduction of a legislative, regulatory and fiscal package to give effect to the strategic direction and policy from now up to 2012.

15 As outlined in a media statement by Minister Marthinus van Schalkwyk following a Cabinet Lekgotla in July 2008. A transcript of the speech is available at www.info.gov.za/speeches/2008/08072816451001.htm.

The Energy Efficiency Accord

In May 2005, a group of leading South African companies and the Department of Minerals and Energy (DME) jointly committed to an Energy Efficiency Accord (EEA), which recognises the importance of energy efficiency and supports the 2005 Energy Efficiency Strategy of South Africa. In terms of the Accord, industry committed to the following actions:

- Developing sector-specific strategies, in partnership with government, to work towards achieving a 12% reduction in energy demand in industry and 15% in mining by 2015 (on 2000 levels)
- Promoting the use of demand-side management (DSM) contracts
- Developing common reporting requirements
- Developing CDM projects

Government commitments include:

- Developing incentives and strategies to achieve sector-specific targets
- Encouraging information-sharing and networking activities with the private sector
- Identifying and sharing best practices
- Promoting CDM projects

Through the voluntary EEA, some of South Africa's largest companies have been working with government to promote and implement energy efficiency. Since the initial signing in 2005, the number of signatories has grown to 44, including eight business associations. The company signatories are from the mining, industrial, petrochemicals, commercial and financial sectors and are largely the top energy users in the country including Eskom, Sasol, BHP Billiton, Anglo American, AngloGold Ashanti, Anglo Platinum and ArcelorMittal.

The NBI initiated the Accord and acts as secretariat to its technical committee, which is made up of energy managers from the signatory companies. The technical committee provides a platform for sharing information, addressing bottlenecks with key role players and sharing energy efficiency best practice.

Achievements of the EEA

According to preliminary findings of an assessment study conducted by the NBI, the collective electricity consumption of only 18 Accord signatories (excluding top energy users like BHP Billiton and Anglo American) is over 47,000 GWh compared with a total national consumption of about 224,000 GWh. This indicates that half of the Accord membership consumes about 21% of South Africa's electricity; this has huge significance for the energy efficiency potential in the Accord. The study shows that 12 of these companies have made electrical energy savings of about 1,140 GWh, equivalent to the average consumption of over 250,000 households in South Africa. The energy efficiency improvements achieved by the signatories that were able to report ranges between 6% and 20%.

For example, from the base year (2000) Afrisam has made a concerted effort to achieve the required target of 15% energy efficiency per production unit saving by 2015. Afrisam has increased its production output by 50% from 2000 to 2007 while only consuming 11% more energy. This equates to an energy efficiency improvement of 27%. Because of current electricity supply concerns, electrical efficiency has become critical to the company – this figure, per production unit, has improved by 24% over the same period. Similarly, AngloGold Ashanti has reported energy savings of 16% since signing the Accord.

The study shows that 15 Accord signatories have invested over R6 billion in energy efficiency projects with a further R13 billion earmarked for investments over the next three years. While Accord signatories are supportive of it continuing, they are considering a number of recommendations. These include:

- Alignment with Eskom's power conservation programme and the LTMS
- Stronger collaboration between business and government
- Renegotiated targets in the light of energy and climate scenarios
- Commitment to skills development for implementation of energy efficiency
- Development of measurement and reporting frameworks
- Blend of supporting legislation and incentives
- Investment in appropriate research and development

3

The South African CDP: Response Rate and the Carbon Disclosure Leadership Index 2008

This is the second time the CDP has been conducted in South Africa and the first time that it covers the JSE Top 100. This section reviews the characteristics and response rate of the JSE Top 100 respondents, and identifies those companies with the highest scores on the Carbon Disclosure Leadership Index, from both the carbon-intensive and non-carbon-intensive sectors.

Introduction

Incite Sustainability originally brought the CDP to South Africa in partnership with the London-based CDP, and the NBI. This year, Incite Sustainability conducted the analysis and writing of the CDP6 (2008) report, while NBI served as the lead South African partner to the CDP.

The CDP6 (2008) South Africa Report is supported by lead sponsor KPMG, with additional financial support provided by the two core sponsors from 2007 – Frater Asset Management and Macquarie First South Securities – as well as the Nedbank Group.

Brazil was the first developing country to be included in the CDP in 2006, and was joined by South Africa and India in 2007. This year was a first for Chinese companies to respond to the global CDP information request.

This year's survey saw the participation of companies from several new sectors, including construction and engineering, IT consulting and services, and leisure, entertainment and hotels. Of the JSE Top 100 company sample, 60% are new to the CDP and a third of these new companies responded. The response rate has increased from 74% to 85% among the Top 40 companies that were approached last year.

Companies that have now participated in the CDP for two or more years (some because of their dual-listing status), include:

- Absa Group
- Anglo American
- AngloGold Ashanti
- BHP Billiton
- Bidvest Group
- Compagnie Financière Richemont
- Exxaro Resources
- FirstRand
- Gold Fields
- Investec
- Liberty International
- Nedbank Group
- Old Mutual
- Pick n Pay Holdings
- Pretoria Portland Cement
- SABMiller
- Sanlam
- Sappi
- Sasol
- Standard Bank Group

Of the repeat companies, BHP Billiton, Gold Fields, AngloGold Ashanti, Sasol, Anglo American, Nedbank, SABMiller, FirstRand, Standard Bank and Pick n Pay are among those companies that have been highly rated in this year's 2008 Carbon Disclosure Leadership Index (CDLI).

Some of the companies that either "Declined to Participate," or submitted "No Response" – across different, mostly low-carbon sectors – have expressed their intention to formulate a climate change strategy and in some instances have indicated their intention to disclose their GHG emissions data in the near future. "No Response" submissions include a number of companies that indicated an initial intention to respond but did not do so.

While this year's response has generally been encouraging, the responses from a small section of individual companies and sectors have been disappointing. Sectors with scope for improved disclosure include leisure, entertainment and hotels; media and photography; real estate; and trading companies and distributors.

JSE Top 100 Sample, Sector Categorisation and Response Status

Of the final JSE Top 100 sample, 39 companies fall into the carbon-intensive sectors, identified as those that are subject to high climate change impact.[16] The definition of these sectors in the CDP6 (2008) South Africa Report is based on the guidelines set out by the London CDP, which have been adjusted since CDP5 (2007). Several sectors that were considered carbon-intensive in CDP5 (2007) now have the status of low-carbon sectors (e.g. banks and food retail). Table 3 summarises the sectors categorised as carbon-intensive, while all other sectors are considered low-carbon.[17] Carbon-intensive companies account for 64% of the JSE's total market capitalisation.[18] The 59 low-carbon companies comprise 36% of the JSE's total market capitalisation.

Among the Top 40 companies, which were approached last year, the response rate has increased from 74% to 85%.

Of the repeat companies, BHP Billiton, Gold Fields, AngloGold Ashanti, Sasol, Anglo American, Nedbank, SABMiller, FirstRand, Standard Bank and Pick n Pay are among those companies that have been highly rated in this year's 2008 Carbon Disclosure Leadership Index (CDLI).

"We are in the process of gathering the data, but as a relatively large construction company this is a very time-consuming process. We are not happy to give incomplete information. It is our intention to get into a position that we can submit next year."

Wilson Bayly
Holmes-Ovcon

16 The final sample size of the CDP6 (2008) was 98 companies, as explained further in the text.

17 The CDP6 (2008) guidelines defined eleven sectors as carbon-intensive (see Table 3). Additionally, the Industrial sector was categorised as carbon-intensive as it meets the general characteristics outlined in the CDP6 (2008) guidelines, i.e. companies in the sector (i) use combustion installations with a rated thermal input exceeding 20 MW, or (ii) companies in the sector may be significantly influenced by GHG emissions regulations or climate change (See reference: CDP6 Questionnaire ABC. CDP, 2008).

18 As per market capitalisation at 31 July 2008, www.sharedata.com.

"We have reviewed your questionnaire and regret that at this time we will not be able to provide a meaningful reply to a significant number of your questions. We believe that a number of questions are very relevant in today's environment and have decided to incorporate additional issues in our future sustainability report. We are optimistic that we will be in a better position to do the questionnaire justice in 2009."

Aveng

Of the Top 100 JSE companies, 39 fall into the carbon-intensive sectors, identified as being those that are subject to high climate change impact.

Table 3 – Carbon-intensive climate change sectors

Aerospace and defence
Automobiles and components
Chemicals
Construction and construction materials
Energy equipment and services
Metals and mining
Oil, gas and consumable fuels
Paper and forest products
Pharmaceuticals
Transportation
Utilities
Additional sectors significantly influenced by GHG emissions or climate change: Industrial conglomerates and industrial machinery, industrial products and services

Note: These sectors are defined exclusively for the purposes of the South African CDP6 (2008) Report, by the CDP organisation.

The metals and mining and chemicals, and integrated oil and gas sectors dominate the JSE Top 100. As a sectoral proportion of the JSE Top 100 by market capitalisation, metals and mining makes up 49%. Of this 49%, the top two companies by market value, Anglo American and BHP Billiton, contribute 15% and 13% to the total value respectively.

The financial services sector is also well represented with five large South African banks, four diversified financials and five insurance companies in the sample. Other sectors that are well represented in terms of market capitalisation include beverages and tobacco and telecommunication services.

The JSE Top 100 sample was reduced to 98 when two companies were removed from the sample due to changes in corporate standing.[20] Of the 98 companies in the sample, 58 (59.2%) answered the questionnaire, while 18 declined to participate, and 22 companies did not respond at all (see Table 4). Of the 58 that submitted questionnaires:

- Two companies (Illovo Sugar and African Oxygen) responded via parent companies not listed on the JSE
- One company (Steinhoff International) did not submit a comprehensive group response, but responded via its subsidiaries PG Bison, Unitrans Passenger and Unitrans
- Two companies (Rand Merchant Bank and Allied Technologies) responded via another parent listed in the JSE Top 100
- One company (Mondi) responded via its international parent company (Mondi Plc) listed on the JSE

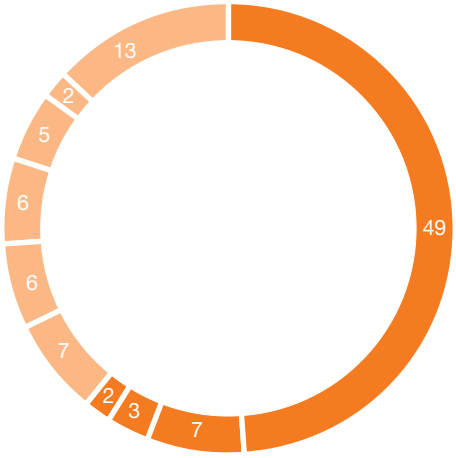
The actual number of questionnaires analysed for this report was therefore 53.[21] For Illovo Sugar, African Oxygen and Steinhoff, responses have not been included in quantitative analysis but have been reviewed for qualitative commentary.

Table 4 – CDP6 (2008) – JSE Top 100 responses

Final sample size	98	100.0%
Answered questionnaire (“AQ” and “AQ not public”)	58*	59.2%
Declined to participate (“DP”)	18	18.4%
No response (“NR”)	22	22.4%

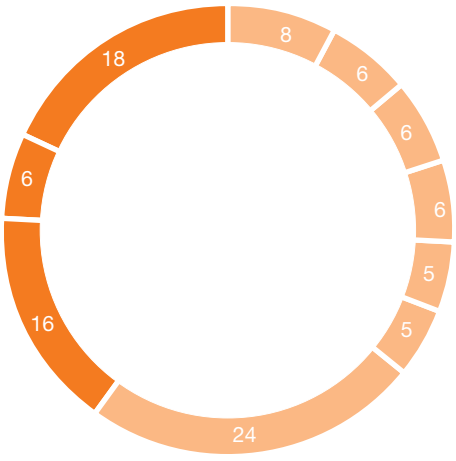
* includes 2 companies that have responded via their parent company not listed on the JSE (Illovo Sugar, Afrox)
includes 1 company that responded via its various subsidiaries (Steinhoff)
includes 2 companies that have responded via another company listed in the JSE Top 100 (RMB, Allied Technologies)
includes 1 company that responded via another company listed on the JSE (Mondi Plc)
excludes 1 company that submitted a response late (Harmony Gold Mining)

Figure 2 – JSE Top 100 by market capitalisation – highlighting carbon-intensive sectors



Metals and mining	49%
Chemicals and integrated oil & gas	7%
Industrial	3%
Steel	2%
Banks	7%
Beverages and tobacco	6%
Telecommunication services	6%
Textiles, apparel and luxury goods	5%
Diversified financials	2%
Other	13%

Figure 3 – JSE Top 100 by number of companies – highlighting carbon-intensive sectors



Real estate	8%
Banks	6%
Diversified financials	6%
Food products	6%
Insurance	5%
Food and drug retailing	5%
Other low-carbon sectors	24%
Metals and mining	16%
Construction and engineering and construction materials	6%
Other carbon-intensive sectors	18%

indicates carbon-intensive sector

20 Note that the term JSE Top 100 is used throughout this report to indicate the final sample of 98 companies.

21 Note that “responding sample” of 53 is used throughout the report to indicate the actual number of companies that submitted CDP6 (2008) questionnaires, excluding submissions via parent companies not listed on the JSE but including responses via a parent company listed in the JSE Top 100 or a via an international company listed on the JSE.

Table 5 – JSE Top 100 company response status

Company	Sector	2008	2007
Absa Group	Banks – Africa	AQ	AQ
AECI	Chemicals	NR	–
African Bank Investments	Banks – Africa	NR	NR
African Oxygen Ltd – see Linde Group	Chemicals	AQ	–
African Rainbow Minerals	Metals and mining	AQ	–
Allied Electronics Corporation (Altron)	Electronic equipment and instruments	AQ	–
Allied Technologies – see Allied Electronics Corp (Altron)	Telecommunication services	AQ	–
Anglo American	Metals and mining	AQ	AQ
Anglo Platinum	Metals and mining	AQ	AQ
AngloGold Ashanti	Metals and mining	AQ	AQ
Apexhi Properties A,B,C	Real estate	NR	–
ArcelorMittal South Africa	Steel	AQ	NR
Aspen Pharmacare Holdings	Pharmaceuticals	NR	–
Astral Foods	Food products	NR	–
Aveng	Construction and engineering	DP	–
Avi	Food products	AQ not public	–
Avusa (formerly Johnnic Comms.)	Media and photography	DP	–
Barloworld	Industrial	AQ not public	NR
BHP Billiton	Metals and mining	AQ	AQ
Bidvest Group	Industrial products and services	AQ	AQ
Caxton Ctp Publish Print	Publishing	DP	–
Compagnie Financière Richemont SA	Textiles, apparel and luxury goods	AQ not public	AQ not public
Datatec	Software and computer services	DP	–
Dimension Data Holdings	IT consulting and services	AQ	NR
Discovery Holdings	Insurance – Africa	AQ	–
Emira Property Fund	Real estate	DP	–
Exxaro Resources	Metals and mining	AQ	NR
FirstRand	Banks – Africa	AQ	AQ not public
Foschini	Textiles, apparel and luxury goods	DP (IN)	–
Fountainhead Property Trust	Real estate	DP	–
Gold Fields	Metals and mining	AQ	AQ not public
Gold Reef Resorts	Leisure entertainment and hotels	NR	–
Grindrod	Trading companies and distributors	DP	–
Group Five	Construction and engineering	NR	–
Growthpoint Properties	Real estate	NR	–
Harmony Gold Mining Co	Metals and mining	AQ late submission	AQ
Highveld Steel And Vanadium	Steel	DP	–
Hulamin	Steel	AQ not public	–
Illovo Sugar – see Associated British Foods	Food products	AQ	–
Impala Platinum Holdings	Metals and mining	AQ	AQ
Imperial Holdings	Trading companies and distributors	AQ	DP
Investec	Diversified financials – UK and Ireland	AQ not public	AQ not public
JD Group	Speciality retail	DP	–
JSE	Diversified financials – Africa	AQ	–
Kumba Iron Ore	Metals and mining	AQ	NR
Lewis Group	Speciality retail	NR	–
Liberty International	Real estate management and development	AQ	NR
Liberty Life Group	Insurance – Africa	AQ	NR
Lonmin	Metals and mining	AQ	AQ
Massmart Holdings	Multiline retail	AQ	–
Medi-Clinic Corp	Healthcare providers and services	AQ	–
Metorex	Metals and mining	NR	–
Metropolitan Holdings	Insurance – Africa	AQ not public	–
Mondi Limited – see Mondi Group	Paper and forest products	AQ	–
Mr Price Group	Multiline retail	DP	–
MTN Group	Telecommunication services	AQ	AQ
Murray & Roberts	Construction and engineering	AQ	–
Mvelaphanda Group – see Mvelaphanda Resources	Diversified financials	NR	–
Mvelaphanda Resources	Metals and mining	NR	–
Nampak	Industrial	AQ not public	–
Naspers	Media and photography	NR	IN
Nedbank Group	Banks – Africa	AQ	AQ

Key

AQ	Answered Questionnaire
AQ not public	Answered Questionnaire but declined permission to make this public
IN	Provided Information
DP	Declined to Participate
NR	No Response
" – "	Company not included in the 2007 sample

Table 5 – JSE Top 100 company response status *(continued)*

Company	Sector	2008	2007
Netcare	Health care providers and services	AQ	AQ
New Clicks Holdings	Food and drug retailing	AQ	–
Northam Platinum	Metals and mining	AQ	–
Old Mutual	Diversified financials – UK and Ireland	AQ	AQ not public
Pangbourne Prop	Real estate	DP	–
Peregrine Holdings	Diversified financials	NR	–
Pick n Pay Holdings	Food and drug retailing	AQ	AQ
Pretoria Portland Cement	Construction Materials	AQ	AQ
PSG Group	Diversified financials – Africa	DP	–
Rainbow Chicken	Food products	AQ not public	–
Raubex Group	Construction and engineering	NR	–
Redefine Income Fund	Real estate	AQ	–
Remgro	Industrial	AQ	DP
Reunert	Electrical Equipment	AQ not public	AQ not public
RMB Holdings – see FirstRand	Banks – Africa	AQ	–
SA Corporate Real Estate Fund	Real estate	NR	–
SABMiller	Beverages and Tobacco	AQ	AQ
Sanlam	Insurance – Africa	AQ not public	AQ not public
Santam	Insurance – Africa	AQ	–
Sappi	Paper and forest products	AQ	AQ
Sasol	Integrated oil and gas	AQ	AQ
Sentula Mining	Metals and mining	NR	–
Shoprite Holdings	Food and drug retailing	DP	–
Standard Bank Group	Banks – Africa	AQ	AQ
Steinhoff International Holdings – see Unitrans, Unitrans Passenger and PG Bison	Household and personal products	AQ	AQ
Sun International	Leisure entertainment and hotels	DP	–
Super Group	Trading companies and distributors	NR	–
Telkom SA	Telecommunication services	NR	DP
The Spar Group	Food and drug retailing	DP	–
Tiger Brands	Food products	NR	AQ
Tongaat Hulett	Food products	NR	–
Trencor	Trading companies and distributors	DP	–
Truworths International	Textiles, apparel and luxury goods	AQ	–
Wesizwe Platinum	Metals and mining	AQ	–
Wilson Bayly Holmes-Ovcon	Construction and engineering	DP	–
Woolworths Holdings	Food and drug retailing	AQ	–

Compared with last year, there is a good representation of companies across sectors. The insurance sector has a 100% answered questionnaire (AQ) rate, while the mining and metals sector has a 75% AQ rate.

Late submissions were expected from three companies (Telkom SA, Tongaat Hulett and Growthpoint Properties), but were not provided before the deadline date. Harmony Gold Mining Co submitted its response after the deadline; the company's response has thus not been included in the analysis, but will be made available on the CDP website.

Companies that declined to participate or did not respond are found across the full range of sectors, but with a higher proportion evident in the following sectors: media; photography and publishing; leisure, entertainment and hotels; real estate; food products; speciality and multiline retail; trading companies and distributors; pharmaceuticals and, to a lesser degree, telecommunication services and diversified financials.

JSE Top 100 Response Rate

In 2008, 59% of the JSE Top 100 responded to the CDP questionnaire – the total number of responding companies this year is more than double that of last year. From the Top 40 companies approached last year, the response rate has increased from 74% to 85%. This relatively high second-time response rate can in part, be attributed to more prominent media coverage of climate change, as well as the increasing expectation that regulatory restrictions will be implemented in South Africa in the near future.

South Africa's response rate of 59% is above the global average rate of 55% across the CDP's participating regions, but below the Global 500 response rate of 77%. It is ahead of countries such as the Switzerland Top 100, the Canada Top 200,

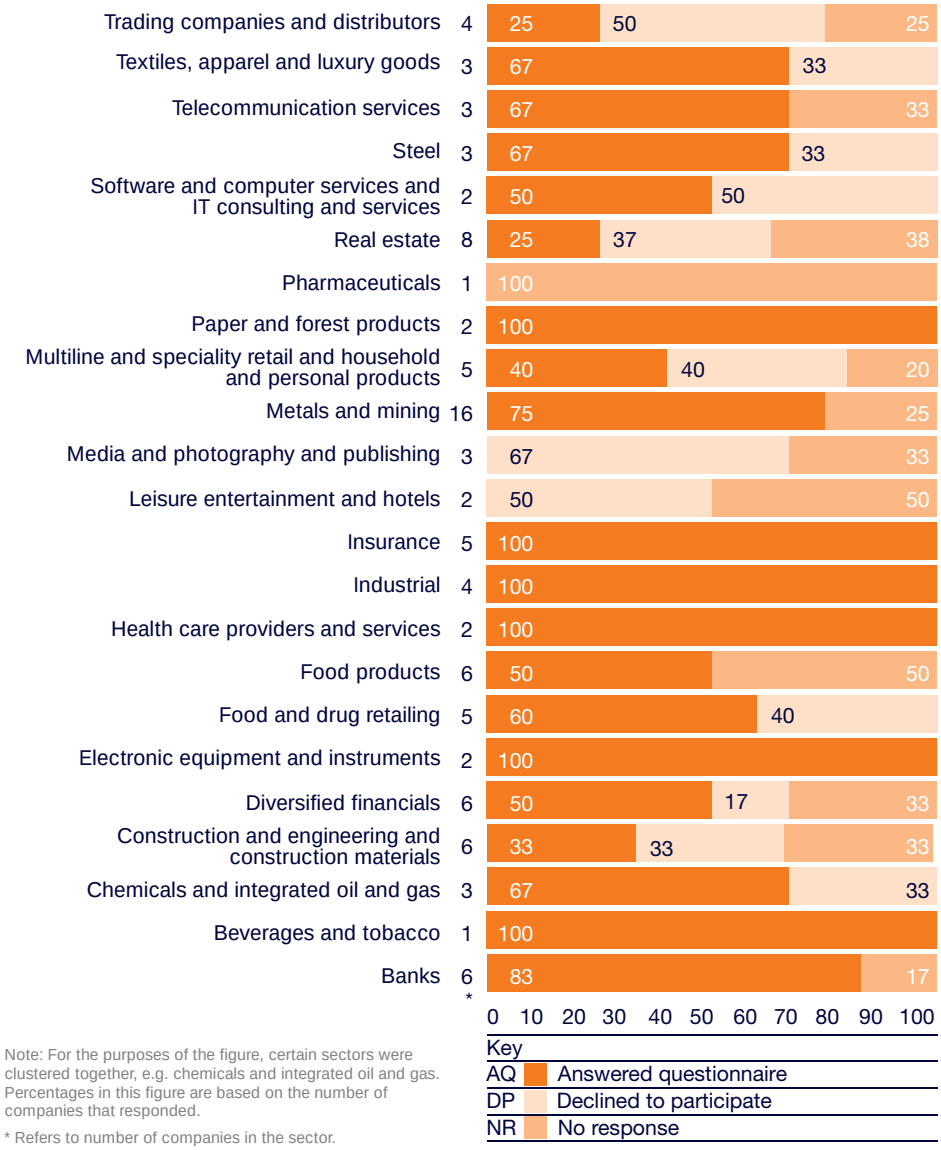
Germany's Top 200, the Netherlands Top 50, the New Zealand Top 50 and the Australian Top 200. While South Africa lags behind Brazil's Top 75 response result of 83%, it is well ahead of India's Top 200 result of 19%. (See also Table on page 6)

Response Rates by Sector
Response rates by sector are indicated in Figure 4. Compared with last year, there is a good representation of companies across sectors. For example:

- Twelve of the 16 companies in the mining and metals sector responded (75%)
- Five out of six companies responded in the banking sector (83%)
- Five out of five companies responded in the insurance sector (100%)
- All four industrial companies responded (100%)

Low response or no response rates were found in the following sectors: real estate; trading companies and distributors; multi-line and specialty retail; pharmaceuticals; household and personal products; construction and engineering; leisure, entertainment and hotels; and media, photography and publishing.

Figure 4 – JSE Top 100 responses by sector (%)



Note: For the purposes of the figure, certain sectors were clustered together, e.g. chemicals and integrated oil and gas. Percentages in this figure are based on the number of companies that responded.

* Refers to number of companies in the sector.

In considering the response rate by sector, the following observations stand out:

- While the 75% response rate in metals and mining is high; demonstrating good awareness and intention, it is important to note that Anglo American, which holds 30% of that sector's market capitalisation, dominates the sector. Interestingly, the remaining 25% of companies in the sector indicated an intention to submit questionnaires, and although they did not follow through with a response (one submitted late), it tends to imply full sector awareness of the relevance of the CDP to this industry. The sector's response was 100% public.[22]
- In the steel sector, ArcelorMittal South Africa submitted a response for the first time this year, as did Hulamin, although the latter chose not to go public with its response.
- The 83% response rate in the banking sector and the 100% response rate in the insurance sector stand out when compared with the 50% response rate among diversified financials. Two insurance sector companies, Sanlam and Metropolitan Holdings, chose not to go public with their responses.[23] In the diversified financials sector, Investec also opted not to go public for the second year running.
- The integrated oil and gas and chemicals sector is dominated by Sasol, which makes up 95% of the market capitalisation of that combined sector. Sasol was the only company in the sector to respond to CDP6 (2008).
- The electronic equipment and instruments is a small sector with a small market capitalisation, which drew a 100% response rate, but the two companies that responded submitted no emissions data.
- There was a good response from the industrial sector, but half the respondents chose not to go public.
- Companies in the leisure, entertainment and hotel sector as well as the media, photography and publishing sector, failed to respond.

Table 6 – Response trends in the metals and mining and steel sectors

Company	CDP6 (2008) Top 100 response	CDP5 (2007) Top 40 response
African Rainbow Minerals	AQ	–
Anglo American	AQ	AQ
Anglo Platinum	AQ	AQ
AngloGold Ashanti	AQ	AQ
ArcelorMittal South Africa	AQ	NR
BHP Billiton	AQ	AQ
Exxaro Resources	AQ	NR
Gold Fields Limited	AQ	AQ (not public)
Harmony Gold Mining Co	AQ (late submission)	AQ
Highveld Steel And Vanadium	DP	–
Hulamin	AQ (not public)	–
Impala Platinum Holdings	AQ	AQ
Kumba Iron Ore	AQ	NR
Lonmin	AQ	AQ
Metorex	NR (some indicated intention)	–
Mvelaphanda Resources	NR (some indicated intention)	–
Northam Platinum	AQ	–
Sentula Mining	NR (some indicated intention)	–
Wesizwe Platinum	AQ	–

Note: CDP 5 (2007) response not applicable ("–") for companies that did not form part of the 2007 JSE Top 40 sample.

22 In those instances where companies have chosen to have a "Not Public" response, their data cannot be represented individually against their name and they cannot be quoted directly. Companies contributing non-public data to the CDP6 (2008) report are: Avi, Barloworld, Compagnie Financière Richemont, Hulamin, Investec, Metropolitan, Nampak, Rainbow Chicken, Reunert and Sanlam.

When compared to the CDP6 (2008) Global 500 analysis, the JSE Top 100 companies fare comparatively well in terms of their awareness of the risks and opportunities relating to climate change.

Most companies in the total JSE Top 100 sample consider climate change to represent both general risks and opportunities equally (87%).

Table 7 – Response trends in the banking and diversified financials sectors

Company	CDP6 (2008) Top 100 response	CDP5 (2007) Top 40 response
Absa Group	AQ	AQ
African Bank Investments	NR (some indicated intention)	NR
FirstRand Limited RMB Holdings	AQ	AQ (not public)
Investec	AQ (not public)	AQ (not public)
JSE	AQ	–
Mvelaphanda Group – see Mvelaphanda Resources	NR	–
Nedbank Group	AQ	AQ
Old Mutual	AQ	AQ (not public)
Peregrine Holdings	NR	–
PSG Group	DP	–
Standard Bank Group	AQ	AQ

Note: CDP 5 (2007) response not applicable ("–") for companies that did not form part of the 2007 JSE Top 40 sample.

Comparative Overview of Response Trends

Climate Change Awareness

When compared to the CDP6 (2008) Global 500 analysis, the JSE Top 100 companies fare comparatively well in terms of their awareness of the risks and opportunities associated with climate change. More of the JSE Top 100 companies consider climate change to present physical risks (89%) than the Global 500 (74%), while the percentage for regulatory risks is similar (76% and 74% for the JSE Top 100 and the Global 500 respectively). There is also a similar response with regard to regulatory and physical opportunities, with 85% of the JSE Top 100 identifying regulatory opportunities and 64% highlighting physical opportunities.

Disclosure Across Key Trend Indicators

Figure 5 compares CDP6 (2008) key response trends to those from CDP5 (2007), while Figure 6 differentiates key response trends between carbon-intensive and low-carbon sectors for CDP6 (2008).

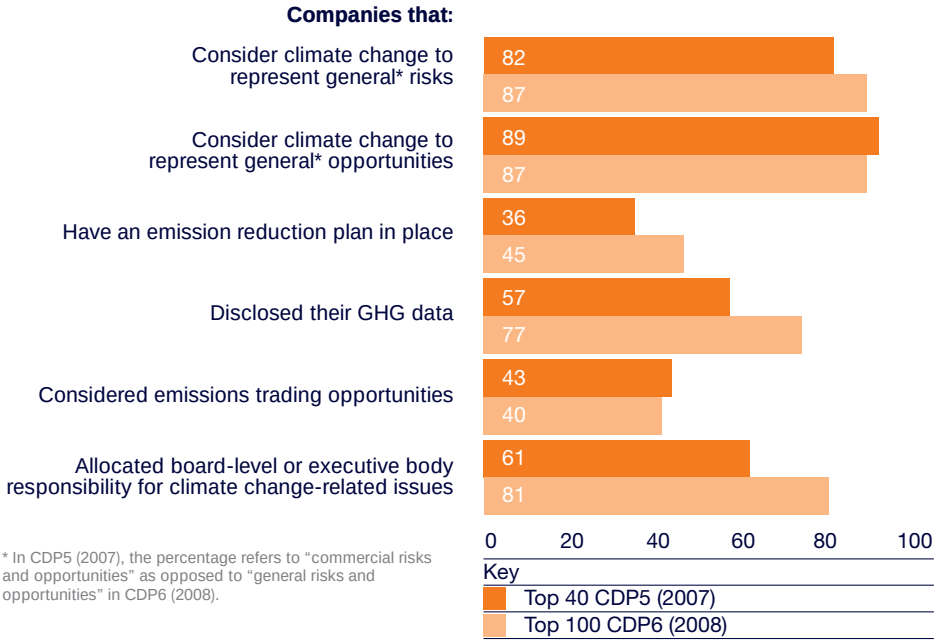
In four of the six key indicators identified in Figures 5 and 6, there is evidence of increased positive action and awareness regarding climate change since last year. It is most encouraging to see that disclosure of GHG data has increased markedly, as has the allocation of executive responsibility for climate-related issues. Interestingly, companies in the current CDP sample identify climate change as representing both general risks and opportunities equally (87%).

Although emissions reduction planning appears to have improved by 9%, this warrants further investigation as there is evidence of possible confusion between emission reduction and energy efficiency targets. While some companies have suggested that they have emissions reduction targets, they have failed to identify what these targets are, and in some instances have simply listed energy efficiency targets.

The consideration of emissions trading opportunities appears to be consistent with last year. However, on further analysis it is evident that of the 40% positive response, only half are currently actively involved in activities and the other half are still in an awareness-and-planning phase.

23 Sanlam changed the status of its response from not public, to public after the CDP6 (2008) analysis had been completed. Due to the late notice, the Sanlam response could unfortunately not be treated as a public response in this report.

Figure 5 – Response rates of participating companies for key trend indicators – comparing CDP6 (2008) vs. CDP5 (2007) (%)

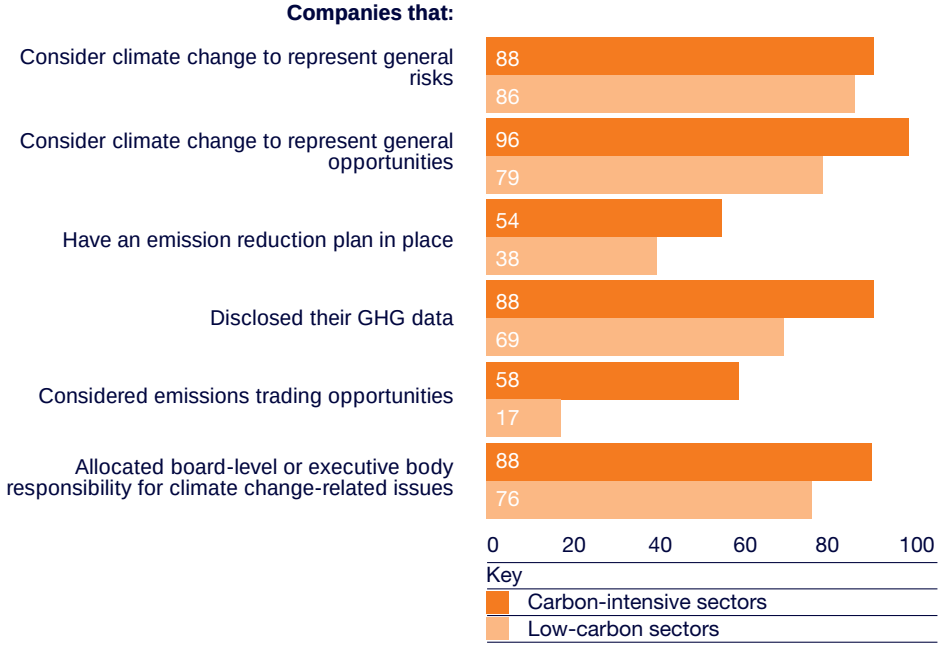


* In CDP5 (2007), the percentage refers to "commercial risks and opportunities" as opposed to "general risks and opportunities" in CDP6 (2008).

Despite the high disclosure rate for responding companies, there is still the challenge of a lack of comprehensive carbon disclosure by the country's top 100 listed companies.

As expected, carbon-intensive sectors display greater positive action and awareness in all key indicators identified when compared with low-carbon sectors. Perhaps surprisingly, despite the fact that the carbon-intensive sector group is likely to be most challenged by the risks associated with climate change, a very high percentage of carbon-intensive companies (96%) identify the existence of positive opportunities associated with climate change.

Figure 6 – Response rates of participating companies for key trend indicators – comparing carbon-intensive vs. low-carbon sectors (%)



This year's CDLI results show that low-carbon sector companies are taking climate change issues seriously – some of them more so than their carbon-intensive peers.

Emissions Disclosure
While the emissions disclosure rate of the respondent companies is encouragingly high at 77%, it is of concern that in terms of the total number of JSE Top 100 companies that were approached, only 42% have reported their GHG emissions to the CDP6 (2008). In its second year, the South African CDP is still facing the challenge of a lack of comprehensive carbon disclosure by companies.

The total reported Scope 1 and 2 emissions amounted to 218 million metric tonnes of CO_2e, the bulk of which originated from the operations of carbon-intensive companies (97%). While carbon-intensive companies report higher Scope 1 emissions than indirect Scope 2 emissions (60% Scope 1 emissions vs. 40% Scope 2 emissions), the low-carbon companies' impact is mainly related to energy consumption (34% Scope 1 emissions vs. 66% Scope 2 emissions).

Understanding Scope 1, 2 and 3 Emissions[24]

Scope 1: Direct GHG emissions
Scope 1 GHG emissions occur from company owned or controlled sources. These include, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles etc., emissions from chemical production in owned or controlled process equipment.

Scope 2: Electricity indirect GHG emissions
Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Scope 2 emissions physically occur at the facility where electricity is generated.

Scope 3: Other indirect GHG emissions
Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials, transportation of purchased fuels; and use of sold products and services.

Carbon Disclosure Leadership Index

Developed to identify companies with outstanding disclosure practices, the Carbon Disclosure Leadership Index (CDLI) assessment is based on the quality of information disclosed by companies in response to the CDP6 (2008) questionnaire.

The CDLI methodology (see Appendix 2) assesses the response of all participating companies for all the issues covered in this year's CDP questionnaire. For every question, companies received a score depending on the availability and depth of their response. Appendix 2 describes the allocation of CDLI scores. The maximum possible score per question was the same for all companies, regardless of whether they form part of the carbon-intensive or the low-carbon sector category.

Differences between the two sector categories were acknowledged by measuring total scores against a defined expectation horizon. This expectation horizon was considerably lower for low-carbon companies (assumed maximum of 85) than for carbon-intensive companies (139 or 146 maximum achievable points, depending on whether the company participates in the European Emissions Trading Scheme (EU ETS)). The total score of each company was then normalised against the expectation horizon of the relevant category to limit the maximum score of 100.

The CDLI results for CDP6 (2008) show that the leading low-carbon sector companies achieve higher

24 WRI/WBCSD The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004).

scores than their carbon-intensive counterparts. This is mainly because of the lower expectation horizon as defined in the CDLI methodology. Notwithstanding this caveat, it is evident that low-carbon sector companies are taking climate change issues seriously – with some of them showing a more effective response and a more nuanced understanding, than those of their peers in the carbon-intensive sector. On several questions, the low-carbon CDLI leaders score better than the maximum the CDLI methodology assumes to be realistic for this category.

The CDP6 (2008) CDLI of 20 companies lists the Top 10 leaders for the carbon-intensive and low-carbon sectors respectively. Table 8 and 9 present the respective rankings.

Among the carbon-intensive sector companies, three metals and mining companies lead the ranking, each scoring over 70 normalised points. BHP Billiton qualified as the overall disclosure leader in the carbon-intensive category, building on several years of experience in carbon reporting and active management of climate change related issues. The metals and mining sector dominates the carbon-intensive CDLI Top 10 with six inclusions. In addition, two of the four participating industrial companies scored for the carbon-intensive CDLI Top 10.

Among the low-carbon companies, Woolworths provided the most inclusive response to CDP6 (2008) and qualified as the category leader with 95 normalised points. Dimension Data Holdings followed as a second leader with 94 normalised points. Both companies demonstrated a thorough understanding of carbon issues and exceeded the assumed low-carbon maximum score for most questions. The third company to score 90 CDLI points and more was Massmart Holdings.

The retail sector is represented with three companies in the low-carbon CDLI Top 10. Furthermore, SABMiller, as another retail-related company, is included among the CDP6 (2008) disclosure leaders. Another sector with strong representation in the low-carbon CDLI Top 10 is banking (three inclusions).

Six of last year's leaders have qualified for this year's CDP6 (2008) CDLI.

Table 8 – CDLI leaders – carbon-intensive sectors

Rank	Company	Sector	CDLI Score
1	BHP Billiton	Metals and mining	77
2	Gold Fields	Metals and mining	73
3	AngloGold Ashanti	Metals and mining	72
4	Sasol	Integrated oil and gas	68
5	Exxaro Resources	Metals and mining	64
6	Northam Platinum	Metals and mining	62
7	Anglo American	Metals and mining	59
8	Remgro	Industrial	57
9	Murray & Roberts	Construction and engineering	55
10	Bidvest Group	Industrial	54

Table 9 – CDLI leaders – low-carbon sectors

Rank	Company	Sector	CDLI Score
1	Woolworths Holdings	Food and drug retailing	95
2	Dimension Data Holdings	IT consulting and services	94
3	Massmart Holdings	Multiline retail	90
4	Nedbank Group	Banks	89
5	Pick n Pay Holdings	Food and drug retailing	88
6	SABMiller	Beverages and tobacco	82
7	Medi-Clinic Corp	Healthcare providers and services	76
8	Liberty Life Group	Insurance	73
	FirstRand	Banks	72
9	Standard Bank	Banks	72

Overall, low-carbon sector companies achieved higher average CDLI scores than their carbon-intensive counterparts.

The CDLI can only include companies that responded publicly. Two low-carbon companies with non-public responses reached scores high enough to qualify for the CDLI, but had to be excluded due to their decision not to disclose their reports.[25]

As expected, the ranking has changed considerably since CDP5 (2007) due to the new, more inclusive assessment methodology and the extended sample size (JSE Top 100 vs. Top 40). Nevertheless, six of last year's Top 10 leaders have again qualified for the CDLI.[26]

Overall, low-carbon sector companies achieved higher average scores than carbon-intensive respondents due to the differing benchmarks for each in the CDLI methodology. The expectation horizon for low-carbon sector companies may need to be reviewed as currently it underestimates the readiness of companies to respond to the CDP. In an unregulated carbon environment, such as South Africa, driving factors for carbon disclosure – including pressure from competitors and consumers – can affect low-carbon companies with a high exposure to consumer markets even more strongly than their industry-focused carbon-intensive counterparts. In addition, low-carbon sectors such as food retailers and producers appear to feel significantly exposed to physical climate change risks. Banking and finance sectors recognise climate change as a risk that can have a significant effect on their business strategy and success.

Incite/CDP asked KPMG to provide an external assurance on the application of the Carbon Disclosure Leadership Index (CDLI) scoring methodology as set out in Appendix 2. The work performed included an assessment of a sample of responses against the scoring methodology and an assessment of the integrity of the allocated score. Any deviations from the scoring methodology were raised as issues and appropriately resolved. On this basis, Incite/CDP is confident that the methodology has been appropriately applied.

25 The Sanlam response scored 79 CDLI points. The company changed the status of its response from not public to public after the CDP6 (2008) analysis had been completed.

26 CDP5 (2007) disclosure leaders included in CDP6 (2008) CDLI: BHP Billiton, SABMiller, Anglo American, Sasol, Pick n Pay, and Nedbank.

4

JSE Top 100 Responses: Key Findings and Themes

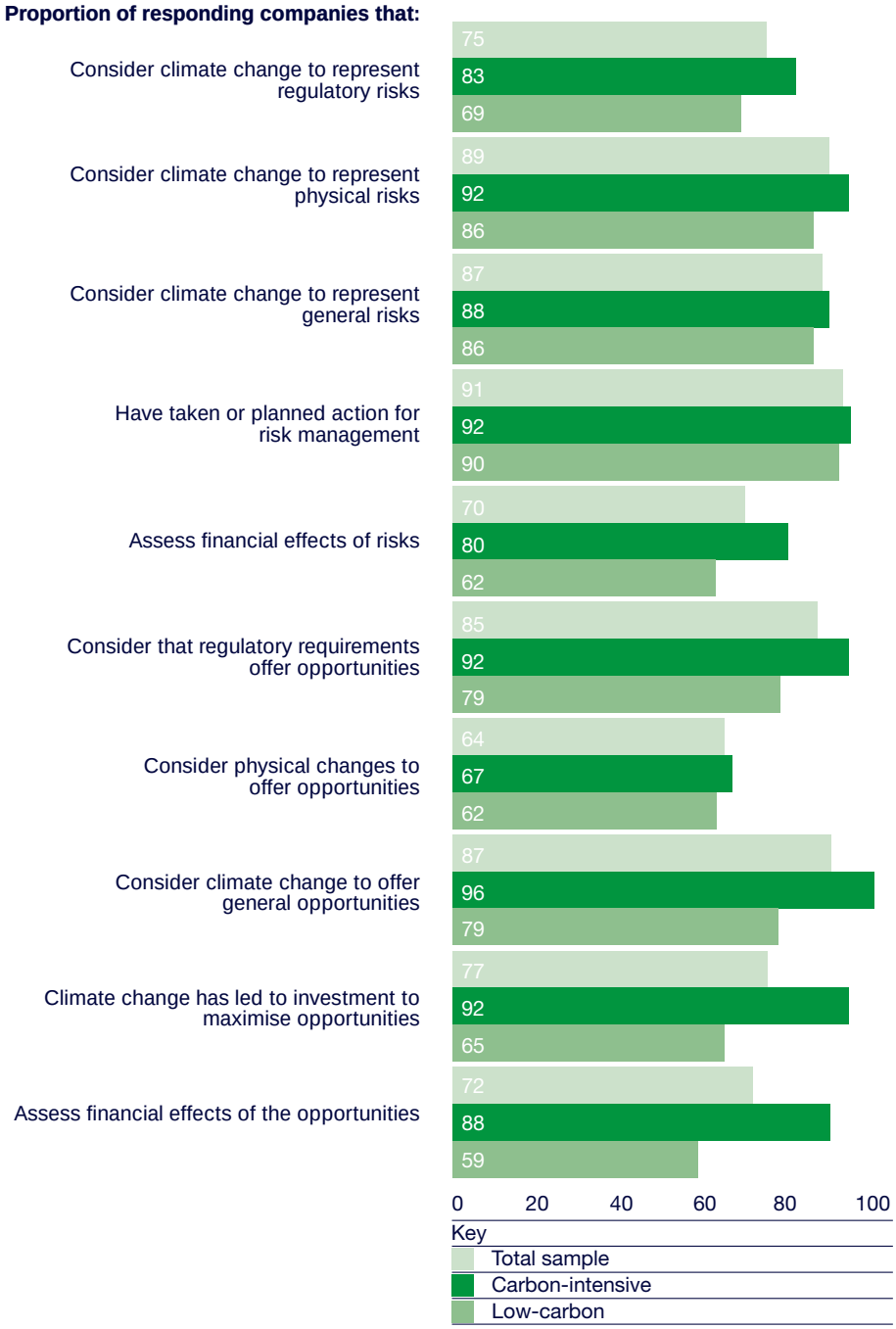
This section provides an analysis of the responses from the JSE Top 100 companies. The section reviews the level of corporate awareness and responsiveness to climate change, and assesses the current level of corporate disclosure on greenhouse gas emissions.

Overall, JSE Top 100 companies have a sound, sector-specific understanding and awareness of both the risks and opportunities that climate change poses to their operations.

Corporate Awareness and Understanding of Climate Change

The level of awareness and understanding of the corporate sector to climate change was determined by evaluating companies' assessments of the strategic risks and opportunities that climate change presents for their operations. These risks and opportunities are seen to fall in three categories: regulatory, physical, and general.

Figure 7 – Response trends of companies to climate change risks and opportunities (%)



The analysis this year suggests that many JSE Top 100 companies have a sound, sector-specific understanding and awareness of both the risks and opportunities that climate change poses to their operations. However, there are some noticeable differences between company responses across sectors in both the carbon-intensive and low-carbon categories. While, in the main, company responses were comprehensive, some companies submitted responses that were surprisingly weak, with minimal information and data provided. At times, this was in a sector where peers had submitted strong responses, suggesting that there are still substantial differences within sectors in individual companies' understanding of the effects of climate change on operations.

Companies in the carbon-intensive sectors are leading in prioritising climate change as a key part of their business.

Six of last year's leaders have qualified for this year's CDP6 (2008) CDLI.

Overall, low-carbon sector companies achieved higher average CDLI scores than their carbon-intensive counterparts.

In the risk category, the main areas highlighted in order of perceived importance include:

- Physical risks related to water and energy availability, as well as with the costs and physical risks related to fuel shortages
- Regulatory risks around energy use and GHG emissions controls, and for some companies the future enactment of carbon constraints
- The reputational risk that companies face from not actively addressing climate change

In terms of climate-related opportunities, the following issues (in order of importance) were identified:

- The potential for emissions trading and renewable energy projects
- The potential for new business opportunities and new products that meet changing consumer and corporate demands
- Enhanced reputational benefits for those companies perceived to be proactively and comprehensively addressing climate change
- Potential opportunities from implementing more energy-efficient strategies and emission reducing technologies

Figure 7 shows that both the carbon-intensive (92%) and low-carbon sectors (86%) consider physical risks to be the greatest source of concern, followed by general and then regulatory risks. A high percentage of companies have taken, or are planning action, for managing their climate-related risks (92% for the carbon-intensive and 90% for the low-carbon sectors). In terms of their appreciation of regulatory risks, there is a significant difference between carbon-intensive companies (83%) and low-carbon companies (69%). This is understandable, as carbon-intensive companies are more likely to be affected by government regulation.

A remarkably high percentage of the respondent companies (87%) identify business opportunities associated with climate change, with those in the carbon-intensive sectors being particularly positive (96%) about the potential business opportunities.

A noteworthy discrepancy between the sector categories is evident in the financial arena. The assessment of financial effects of risks and/or the financial effects of opportunities is significantly lower in the low-carbon sectors (62% of companies assess the financial effects of risks and 59% assess the effects of opportunities), whereas the carbon-intensive sectors display 80% and 88% positive responses to assessing financial effects of risks and opportunities respectively.

"Santam recognises that climate change is one of the biggest challenges ever faced by the insurance industry, if not the biggest."

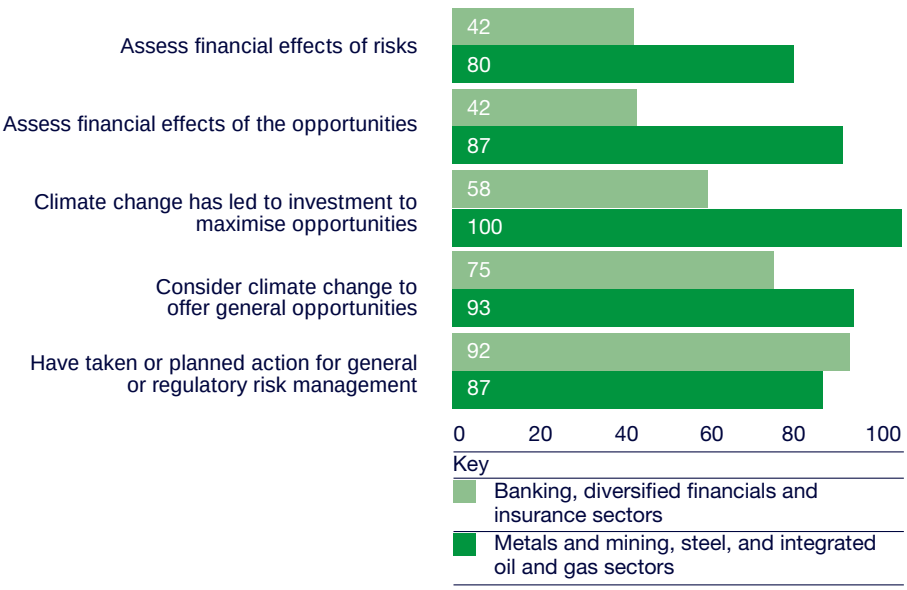
Santam

A high percentage of the responding companies identify primarily general opportunities to be presented by climate change, with companies in the carbon-intensive sectors being particularly optimistic about the business opportunities.

"BHP Billiton believes that the risks of climate change associated with increasing GHG concentrations in the atmosphere need to be addressed through accelerated action, guided by the research of the United Nations Intergovernmental Panel on Climate Change."

BHP Billiton

Figure 8 – Comparison of sector clusters: carbon-intensive vs. low-carbon (%)



Some interesting observations can be made when clustering the banks, diversified financials and insurance sectors, and comparing them to a very different industry cluster, including metals and mining, steel, and oil and gas (see Figure 8). Although a greater percentage of the former group have identified action for risk management, they identify fewer opportunities, and have made significantly less investment choices to maximise opportunities than the material resource-based industry cluster. In addition, despite being in the financial and risk management arena, their assessment of the financial effects of both opportunities and risk is significantly less than that of the mining/resource cluster.

Responding to the Risks of Climate Change

Companies responded to three categories of risk types: regulatory, physical and general. In their responses, the general risk category for many companies has included reputational risks. Physical risks were prioritised by both the carbon-intensive and low-carbon sectors, followed by general and then

"It is important to us at FirstRand to strive towards carbon neutrality and to give our full support to the establishment of a low-carbon economy in South Africa and everywhere else in the world that we operate, even if we have to plan for it over the medium and long term."

FirstRand

Key physical risks identified by responding companies include water availability, energy availability and costs, potential fuel shortages, and the increased incidence of extreme weather events.

"It is predicted that changing rainfall patterns will result in both an increase and decrease in rainfall and resultant change in run-off in this watershed, which could have a negative – but to date not quantified – effect on security of long-term water supply."

Sasol

regulatory risks. The high overall response rates (see above) to questions around risks associated with climate change indicates a growing awareness for corporate climate change issues. However, there were notable differences in the comprehensiveness and quality of the responses provided by different respondents, suggesting that the depth of understanding of companies still varies significantly.

Companies recognise South Africa's likely exposure to changes in weather patterns and other physical effects of climate change. The main physical risks identified across sectors include water availability and extreme weather events.

A key general risk highlighted by many companies across sectors is reputational risk – indicating an acknowledgment that public perception of inaction in responding to climate change may be highly influential. Other significant general risks include energy scarcity and the increased cost of transportation due to possible carbon tax and fuel levies. For the insurance sector specifically, policyholders and insurers are seen to be particularly exposed to general risks from climate change, as companies adopt higher pricing structures to insure against the effects of climate change.

The main regulatory risks highlighted across sectors include energy usage regulation and price increases, as well as GHG emissions controls and the likely introduction of carbon constraints.

Physical Risks

The potential physical risks associated with climate change typically include small changes in temperature and precipitation, shifts in species distribution, an increase in the incidence of drought, floods and storm activity, rising sea levels, and higher incidence of disease.

The principal physical risks quoted by the JSE Top 100 responding companies include the availability of water and energy, fuel and energy shortages, increased energy costs, and increased likelihood of extreme weather events. Extreme weather risks are expected to have a particular impact on service-orientated sectors. Other physical risks cited are drought and the spread of vector-borne disease such as malaria.

In the metals and mining sector, a primary concern is reduced water availability. As this is a critical resource for operations, changes in water patterns are regarded as particularly significant.

The banking and diversified financial sector focuses primarily on energy availability, water restrictions and extreme weather events such as flooding, all of which affect the ability to service customers and employees. In addition, there is a risk that projects financed by banks – including property portfolios owned and managed by banks – may be exposed to extreme weather risks related to climate change.

For food producers and retailers, the primary physical risks relate to interrupted supply arising from damages to energy and related infrastructure, fuel shortages and extreme weather events.

Water availability

Ensuring continued access to water is a primary concern of many respondents:

- *Anglo American* expects that, for some of its operations, water availability will become more problematic because of both an increased incidence of drought and growing demand from other water sources.
- *AngloGold Ashanti* predicts that reduced water availability could affect processing capacity at some sites. More frequent and more intense storm events could require more costly engineering safeguards.
- *Impala Platinum Holdings* expects increased operating expenditure because of reduced water supply, which will lead to increased water costs and the potential risk of interruption to production processes.
- *SABMiller* also cites water availability as a major physical risk, commenting that projected climate change patterns can have a material impact on both the availability and quality of water resources in a number of countries in which it operates.

- Paper and pulp company *Sappi* sees a substantial risk relating to drought in South Africa as well as changes in weather patterns and major fire risk.
- Construction and engineering companies *Murray & Roberts* and *Pretoria Portland Cement* report the main physical risks relating to potential water shortages as well as the spread of disease that could affect labour intensive operations.
- *Exxaro* has implemented an integrated water-management system at Grootegeluk Coal to mitigate the risk of production, throughput and equipment loss in cases of extreme weather and to mitigate the risk of water shortages during dry seasons.
- *Lonmin* is undertaking an integrated water and waste management plan (mineral and non-mineral waste) for its operations and has made a commitment to reduce its freshwater intake through several programmes.

Energy availability and costs

Increased electricity costs and disrupted energy supply also emerge as key concerns for several sectors. Although it might be more appropriate to characterise energy cost concerns as a regulatory risk – associated for example with the introduction of carbon taxes – some short-term interruptions to energy supply may occur in the event of extreme weather.

- *Nedbank* notes that the physical risks of climate change have the potential, in extreme cases, to affect its ability to service its customers. The bank continues to experience incidences of branch closure due to unstable energy supply.
- *Sasol* observes physical risks linked to the South African operation centre mainly on the availability of water and electricity.
- *Impala Platinum* expects increased operating expenditure because of higher electricity costs due to cleaner power generation technologies.

Other physical risks

Across sectors, companies cite other diverse physical risks such as "rising insurance costs of assets", "damage to stores and physical assets" and "higher incidences of disease."

- Businesses most likely to be affected by physical risks within the *Bidvest Group* include *Namibian Fishing,* as the company predicts that fish stocks will shrink and migrate due to changing ocean conditions.
- *Santam* reports physical risks from an underwriting and reinsurance perspective while *Discovery Holdings* predicts that the higher incidence of disease resulting from climate change may influence the health and life assurance business, as it will affect the health of medical scheme members and life assurance policyholders.
- *Imperial* comments that possible physical risks include the ability of supply chains to function, a reduction in the handling capacity of major transport hubs such as airports and harbours and increased insurance costs of assets.
- Both *Old Mutual* and *Liberty Life Group* note there is a risk to their physical assets as properties could be exposed to floods, storms or drought.
- *Pick n Pay* states that research and climate models indicate that the company is faced with an increasingly unpredictable situation and is obliged to develop its ability to handle unexpected, potentially extreme events.
- *Massmart* says the key physical risk is the potential damage to store assets because of extreme weather conditions.
- *Remgro* notes that increased ambient temperature might increase air-conditioning and cooling requirements for office-based staff and facilities of its subsidiaries. Flooding also possesses a specific risk for divisions reliant on the agricultural industry.
- *The MTN Group* observes that, compared to regulatory risks, physical risks may affect the availability of *MTN* services and *MTN's* business significantly. Natural disasters due to climate change could damage *MTN's* infrastructure and facilities and affect its business on a large scale.

"As an office-based company, our operations are heavily dependent on reliable access to electricity, which could be disrupted by extreme weather events."

Dimension Data

"The impact of climate change on the availability of natural resources necessary to operate a business (such as energy and water) may negatively impact the JSE's ability to operate our business. Severe climate change will impact our agricultural commodities market (maize, wheat, sunflower seeds and soy beans)."

JSE

Reputational risk was identified as a key emerging issue for many JSE companies across different sectors.

"BHP Billiton has also noted the potential impact of increasing energy prices on our business, both directly and indirectly across our whole value chain."

BHP Billiton

"ArcelorMittal acknowledges that public awareness of the influences of climate change is increasing and the public is also sensitive to the sources of greenhouse gases."

ArcelorMittal

"The impact of climate change on the industry will manifest in the various ways, including: pricing models, futuristic underwriting and futuristic catastrophe modelling will need to be aligned with the changes in the risk profiles."

Santam

General Risks

The potential "general risks" of climate change are those associated, for example, with changes in consumer attitude and demand, reputational concerns, and changing supply chain pressures.

Reputational risk was identified as a key emerging issue for many JSE companies across different sectors. Several companies acknowledge that while public awareness in South Africa is generally limited, this is changing and that companies' reputations could be weakened by inaction. Other general risks cited across sectors include "higher insurance premiums", "energy scarcity" and "the increased cost of transportation due to carbon tax and fuel levies."

In the financial services sector:

- *Nedbank* believes that there is a clear reputational and branding risk associated with not addressing climate change issues proactively.
- *Old Mutual* comments that banks must ensure they have the means to assess and mitigate the increased future default risks inherent in lending to customers who find their products have limited prospects in a low-carbon economy.

In the metals and mining and resource sectors:

- Some of the principal general risks reported are the prospect of litigation, customers possibly switching to alternative products with lower embodied energy, higher insurance premiums and negative reputational risk as public awareness of climate change increases. Another general risk raised is increased pressure from neighbouring communities struggling with disease, crop failure and the depletion of natural resources.
- *Anglo American* points out that, "There is potential reputational risk arising from failing to reduce emissions and otherwise failing to respond to the challenge of climate change."
- *Mondi* says a key risk is increased customer awareness of climate change issues. For example, increased demand for packaging produced in a sustainable, energy-efficient manner (low-carbon or with low embedded carbon).

In the retail and foods sectors:

- Pick n Pay says a combination of regulatory, physical and general risks may in future disrupt some of its supplier relationships as products become commercially unviable or supplier operations and transport networks are affected.
- Food producer *Illovo Sugar,* via its parent company *Associated British Foods*, highlights increasing prices for agricultural products, that can be affected by weather conditions.

In other sectors:

- Healthcare companies *Netcare* and *Medi-Clinic Corp* identify energy scarcity and increases in the cost of private healthcare as general risks.
- Construction groups *Pretoria Portland Cement* and *Murray & Roberts* highlight reduced raw materials and increased cost of transportation due to carbon tax and fuel levies. The construction companies add that another general risk is being regarded as "climate change laggards" – especially by European investors.

Regulatory Risks

Regulatory risks generally arise from current and/or expected national and/or global policy on climate change, such as the introduction of emissions limits and energy efficiency standards. The majority of respondent companies note that while there are currently no regulations or obligatory targets governing GHG emissions, or mandating energy efficiency in South Africa, this is set to change.

The main regulatory risks cited by responding companies include energy price increases and regulation around energy usage, regulations targeting GHG emissions and the likely introduction of a carbon tax.

In the metals and mining sector:

- Many companies are expecting GHG emissions regulation in South Africa post-2012. Several companies in this sector emphasise that carbon taxes are currently being considered in South Africa.
- *BHP Billiton* notes that the key risk areas resulting directly or indirectly from regulatory measures are energy price increases, emissions trading cost exposures and reporting compliance costs.

- Anglo American says its operations are responsible for significant emissions of greenhouse gases. While only a minority of these emissions originate in countries that currently impose emission restrictions, the company expects more restrictions in time.
- There is some concern among companies in this sector about reduced production should emission caps be imposed. Other concerns include administrative burdens associated with compliance, as well as the cost of investing in new, less carbon- or energy-intensive materials. Companies note that, in the short term, significant investment will be required to reduce emissions.

In the retail sector:

- Several companies are watching the development of the National Waste Management Bill, which is informed by the European model and places greater responsibility on manufacturers and retailers to reduce and safely dispose of post-consumer waste.
- Some retailers observe that it is likely that a carbon tax of some form will be introduced over the next few years.
- Many retail companies anticipate that GHG regulations and increased clean fuel standards will have a significant direct impact on their commercial and corporate fleet, ultimately resulting in price increases for the consumer. In addition, future legislation will affect the choice of stock offerings in stores, such as the sale of energy-efficient electrical appliances.

In the banking and insurance sector:

- Several companies highlight concerns around the potential regulation of the financing of emission-intensive activities.
- Some suggest that customers with properties in flood risk areas could struggle to obtain insurance or will see their premiums rise.
- There is concern around general carbon market regulation, including regulation around the nature and type of trading.

Overall, across different sectors, there is awareness that stricter imminent climate change regulations will necessitate more time and money being spent by companies on administration and changing and/or implementing new computer software systems for data collection and monitoring.

- *Imperial* says its operations in South Africa may potentially be exposed to GHG regulation in future in the form of a carbon tax.
- *Woolworths* notes that regulation governing GHG emissions will have a significant direct impact on its distribution fleet.

Risk Management

Responding companies were asked whether they had taken or planned action to manage the general and regulatory risks and/or adapt to the physical risks identified. Although there were diverse responses across carbon-intensive and low-carbon sectors, there were some common issues that emerged:

- A key focus to reduce energy use and GHG emissions throughout operations.
- Most companies highlight the need for a greater focus on energy efficiency and reducing reliance on traditional energy supply.
- There is a generally recognised need to monitor GHG emissions and to formulate a comprehensive climate change response programme, as well as adopting a strategic position on climate change.
- Many companies express their commitment to reduce emissions associated with their operations and to take steps in particular to address vehicle emissions.

Responding to Climate Change Opportunities

There is a sound appreciation amongst JSE Top 100 companies that climate change presents important business opportunities. Among JSE Top 100 companies this year, 92% in carbon-intensive sectors and 79% in low-carbon sectors believe regulatory requirements offer possible business opportunities, while 96% of companies in the carbon-intensive sectors and 79% of companies in low-carbon sectors see “general opportunities”.

Most JSE Top 100 companies are anticipating regulatory changes in South Africa in the near future.

“International regulations are increasingly supporting the reduction in the use and import of coal. For Exxaro Resources, export volumes and the quality thereof may be affected over time.”

Exxaro

“Sappi is ahead of the game in that more than 40% of all our energy needs are met by renewable energy from our own operations. In addition we buy biomass as a fuel source in some of our operations.”

Sappi

Companies in the banking and financial services sector highlight concerns around potential regulation related to the financing of emission-intensive activities.

"The implications of increasing fuel and energy costs, together with regulatory compliance, are extremely significant for our company and likely to have an impact in the cost of goods."

Truworths International

Key regulatory opportunities identified by companies across sectors include the potential for emissions trading projects, investments in CDM projects, investments in renewable energy and the growth of markets for environmentally friendly products.

At a general level, across sectors, the following potential business opportunities of climate change were identified:

- Developing emissions trading projects
- Actively pursuing Clean Development Mechanism (CDM) projects
- Developing new technologies that could reduce GHG emissions
- Investing in renewable energy
- The potential for an enhanced reputation resulting from a pro-active stance on climate change.

Business opportunities that are seen to be specific to certain sectors include:

- Heightened demand for certain commodity products in the metals and mining sector (such as platinum for catalytic converters, or increased demand for steel or aluminium for building material in response to storm events)
- Meeting changing demands for "greener" products in the retail sector
- Potential new business opportunities associated with unusual weather patterns, including the provision of heating and/or insulation solutions.

Regulatory Opportunities

Regulatory opportunities generally arise from current and expected national or international governmental policy on climate change. For example, the introduction of emissions trading programmes, technology incentives and imposition of process or product standards can provide opportunities.

Some of the key regulatory opportunities identified by the responding JSE Top 100 companies include the potential for emissions trading projects, investments in CDM projects, investments in renewable energy or expected demand to finance the development of renewable energy projects and the growth of markets for environmentally and climate friendly products (specifically for retailers).

Overall, when commenting on regulatory opportunities, larger companies with offshore listings indicate that they can use the knowledge and experience gained in their offshore operations to achieve competitive advantage in the South African market in areas such as emissions trading projects and renewable energy initiatives.

In the financial services sector:

- Several institutions are looking at investing in CDM projects, using socially responsible investment (SRI) funds.
- A number of companies in this sector, primarily banks, highlight the potential regulatory opportunities in the form of increasing investments in renewable energy or demand to finance the development of renewable energy projects.
- Some companies also see new business opportunities in the carbon finance area.
- *Nedbank* has set up a carbon finance team that is involved in the origination of CDM projects, while the *JSE* notes that legislation set by government will open doors to develop new markets that will assist listed companies with mitigating their risks, such as the trading on carbon credits.

In the metals and mining sector:

- Most companies cite the potential for emissions trading projects, investments in and opportunities around CDM projects, carbon-trading opportunities as well as opportunities to develop carbon abatement projects.
- The potential for renewable energy projects is also seen as a key opportunity arising from changing regulations.
- *BHP Billiton* says it considers the primary opportunities to be in the area of emissions trading. To date, it has worked with customers in Europe to explore the potential to create bundled energy products. *BHP Billiton* also sees potential for regulatory frameworks to influence market demand for its low emission energy products, including uranium and natural gas.

- *African Rainbow Minerals* observes that both smelters in the group have initiated carbon trading programmes and projects toward co-generation of electricity.
- *Sasol* observes that South Africa's status in terms of the Kyoto Protocol brings with it the opportunity for the company's South African facilities to obtain carbon credits through the CDM process by reducing their GHG emissions. These credits can be used to increase the viability of financially marginal environmental projects or to facilitate technology transfer from the developed world to South Africa.

Across carbon-intensive and low-carbon sectors, companies note that being proactive on the regulatory front can increase their reputation – fostering brand differentiation, consumer trust and support, employee loyalty – as well as strengthening supplier relationships by providing practical opportunities to engage with climate change challenges.

- *Woolworths* foresees the growth of a significant market for environmentally and climate-friendly products. The company is responding with product labelling around origin of product, as well as setting targets around organic products and other environmental and community initiatives that will broaden its supply base.
- *Massmart* points out that the provisions of the National Waste Management Bill raise a number of regulatory opportunities. These include working with suppliers to reduce packaging, which in turn could lead to better trading densities as reduced packaging can translate into more products on shelf.
- *Netcare* expects that the adverse effect of climate change could, in the long-term, result in individuals seeking treatment for diseases caused by climate change.
- Technology company *Altron* observes that opportunities for deriving income from CDM projects are limited mainly to the manufacturing lines within the Altron group. It intends assessing the potential opportunity to generate carbon credits within the next financial year.

General Opportunities

General opportunities related to climate change generally arise from actual or potential demand for new or modified products and services.

In the financial services sector:

- Several of the responding companies – primarily banks – identify opportunities and new potential partnerships in areas such as carbon finance and renewable energy finance, as well as potential partnerships with select municipalities and local authorities.
- Other opportunities include investment in alternative energy production and solar solutions.

In the mining and metals sector:

- Many companies suggest that the development of new technologies could result in climate change opportunities for large-scale energy savings through clean energy generation of companies' operations.
- Others anticipate increased sales of some mining products.
- *BHP Billiton* says that, in addition to emissions trading opportunities, it is well placed to capture the benefits of shifting demand profiles for a range of energy sources. It may also benefit from increased demand for some of its other mineral commodity products.

"FirstRand believes the financial institutions and the introduction of carbon taxes may enable the drive to reduce carbon emissions could add value in the development of new products."

FirstRand

"Anglo American has a history of developing carbon abatement projects that have helped reduce the GHG intensity of some of our operations"

Anglo American

"A range of CDM projects are being evaluated by Exxaro Resources. The potential for carbon capture and storage as a future technology is also actively being evaluated."

Exxaro

Key issues to emerge under general opportunities include the potential for new technologies (including emission-reducing technologies), opportunities for cost control and opportunities from working with suppliers and clients to promote improved energy efficiency across businesses.

"Liberty Life sees potential for its asset management subsidiary to invest in new industries and business addressing climate change issues such as alternative energy production and solar solutions."

Liberty Life

"Old Mutual believes the shift to a low-carbon economy will require enormous investment, presenting a unique opportunity for corporate finance to develop new lending models. In insurance, new products will be needed for individuals and organisations looking to reduce their exposure to liability claims."

Old Mutual

In the retail sector:

- Some of the respondents identify the emergence of branding opportunities relating to climate change and sustainability issues as well as environmental and economic benefits from reductions in energy usage and transportation efficiencies.
- Some retailers also see opportunities from the sale of specific, environmentally related merchandise, for example products that are more energy-efficient and associated with renewable energy.
- *Truworths International* observes that generally it may see the emergence of a branding opportunity relating to sustainability issues over time. In the shorter term, it may be possible to explore the development of greener retail outlets.
- *Pick n Pay* expects to increase its range and sales of green and organic products.

In the real estate sector:

- *Redefine Income Fund* highlights opportunities for implementing new technologies and designs for reducing power usage for both air-conditioning and lighting.

Physical Opportunities

Physical opportunities may arise from subtle changes in weather patterns for example, such as a longer growing season, or from more sudden and extreme events. The majority of the JSE Top 100 responding companies anticipated few physical opportunities resulting from climate change for their operations or did not differentiate between general and physical opportunities. No overall picture emerged from this category.

- *Anglo Platinum* anticipates that demand for platinum will increase as the technological development of fuel cells gains momentum, noting that interest in the development of fuel cell technology has accelerated dramatically over the last decade.
- *Murray & Roberts* expects physical threats to coastal operations, for example, to offer the construction group opportunities to construct new facilities or develop existing facilities to mitigate those threats.

Maximising Opportunities

Companies were asked whether they have invested in – or are planning to invest in – products and services that have been designed to minimise or adapt to the effects of climate change. As with the responses relating to risk management, the most comprehensive submissions came primarily from companies in the metals and mining, financial services and retail sectors.

- Several companies in metals and mining and financial services sectors are investing in products and services to address climate change, including carbon-based energy and greenhouse gas emissions reduction projects, as well as CDM projects.
- Some of these companies are also investing in large-scale projects in renewable energy and projects that provide long-term carbon trading opportunities.
- Several companies in the financial services sector say initiatives are actively underway to identify financing opportunities for environmentally friendly energy sources, as well as establishing carbon finance teams involved in the origination of CDM projects.
- Retailers highlight energy efficiency activities in stores, distribution centres and head offices, as well as working with suppliers to develop cleaner production methods. Some also say they have initiated processes to promote environmentally friendly merchandise such as energy-efficient CFL light bulbs and solar water heaters.

Greenhouse Gas Disclosure

Response Trends

Of the responding companies, 77% disclosed their GHG emissions. While this is a significant improvement on last year's emissions disclosure rate of 57%, it is important to recognise that in many instances the reporting companies acknowledged that they have not yet provided a full and accurate assessment of their emissions.

The emissions disclosure rate of carbon-intensive companies was higher (88%) than the emissions disclosure rate of low-carbon companies (69%) (Figure 9).[27] Many of the respondents that did not disclose their GHG emissions said that they plan to report relevant information in future years, once formal systems are in place to track and measure emissions more reliably.

Figure 9 – Emissions disclosure rates (%)

Disclosed Emissions by Sectors

The disclosing companies reported 218,120,955 metric tonnes of direct and indirect CO_2e emissions (Scope 1 and 2).[28] This number corresponds to approximately 50% of the overall GHG emissions assessed for South Africa nationally in 2004 (427.9 million metric tonnes).[29] Direct Scope 1 emissions are generated by sources that are owned or controlled by the company, while Scope 2 emissions are indirect GHG emissions created by the suppliers of purchased electricity.

Figure 10 provides a breakdown of the total reported Scope 1 and 2 emissions by sector.

It shows that the metals and mining and integrated oil and gas sectors are the largest emitters, accounting for more than 75% of total disclosed emissions. Only four other sectors – steel, paper and forest products, construction and beverages and tobacco – account for more than 1% each.

Figure 11 details the much smaller total emissions of the remaining sectors that together account for just 3% of the total reported Scope 1 and 2 emissions. While this group mainly includes low-carbon sectors, it also comprises the industrial sector and the trading companies and distributors sector – two sectors that are categorised as carbon-intensive sectors.

"New Clicks Holdings believes that, as a specialist retail group with a focus on health and pharmaceutical distribution, climate change presents opportunities in the healthcare sector."

New Clicks Holdings

"SABMiller believes that by adapting products to climate change issues, there is an opportunity to appeal to customers and consumers whose preference would be towards "greener" product offerings."

SABMiller

"For Anglo American, it's possible that climate change and its regulation will favour increased sales of some of our products. For instance, platinum group metals are used in fuel cells and in a variety of catalytic roles for which demand might increase as a result of climate change."

Anglo American

27 These statistics exclude a low-carbon company, which limited disclosure to one particular GHG emissions indicator. This company's response would not have allowed for the comprehensive overview that is needed for further analysis and comparison with other companies.

28 The definition of Scope 1 and 2 emissions appears in The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard. World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), March 2004.

29 Compare the World Resources Institute's (WRI) Climate Analysis Indicator Tools (cait.wri.org).

"Medi-Clinic envisages that the adverse effects of climate change on the health of individuals could, in the long-term, result in an increased number of people seeking treatment for diseases and ailments."

Medi-Clinic

"Woolworths has seen that the need for energy saving and reducing emissions has created a renewed focus on location selection and logistics. Good planning capabilities create opportunities for both cost savings and environmental benefits, from a logistics, store location and design perspective."

Woolworths

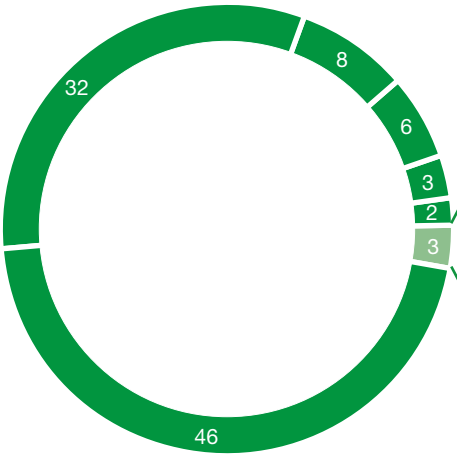
The metals and mining and integrated oil and gas sectors are the largest emitters, accounting for more than three quarters of the total disclosed emissions.

This might imply that the categorisation into carbon-intensive and low-carbon sectors is imprecise. Yet, due to the composition of the JSE Top 100 and of the sample of responding companies, not all sectors are represented in equal numbers of companies in the CDP6 (2008). The lower the number of responding companies that represent a sector, the lower appears the reported total emissions for this sector. As mentioned earlier, the carbon-intensive metal and mining sector is strongly represented in the responding CDP6 (2008) sample (nearly 23% of all respondents), while other sectors are represented by only one or two companies. For this reason the CDP6 (2008) analysis of carbon emissions per sector may in some cases create a slightly misleading impression.

The results are further impacted by the comprehensiveness of the reported emissions as the analysis is based solely on the emissions disclosed by the participating companies. Currently there are significant gaps in corporate emissions reporting, as not all respondents disclosed emissions data and several respondents omitted emissions that they cannot yet quantify reliably (see examples of exclusions in Table 10).

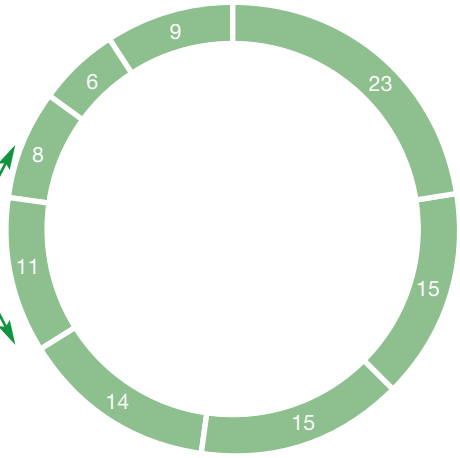
The large differences in GHG emissions disclosed by various carbon-intensive sectors shows that the distinction between carbon-intensive and low-carbon sectors remains arbitrary and is sometimes blurred. The emissions share of the carbon-intensive sector with the least impact (trading companies and distributors, 0.4% of total emissions)[30] amounts to only one quarter of the share of the biggest emitting sector in the low-carbon category (beverages and tobacco, 1.6% of total emissions).

Figure 10 – Total global scope 1 and 2 emissions by sector (sectors with emissions >1% of total emissions)



Metals and mining	46%
Integrated oil and gas	32%
Steel	8%
Paper and forest products	6%
Construction and engineering and construction materials	3%
Beverages and tobacco	2%
Other sectors (ea < 1%)	3%

Figure 11 – Total global scope 1 and 2 emissions by sector (sectors with emissions <1% of total emissions)

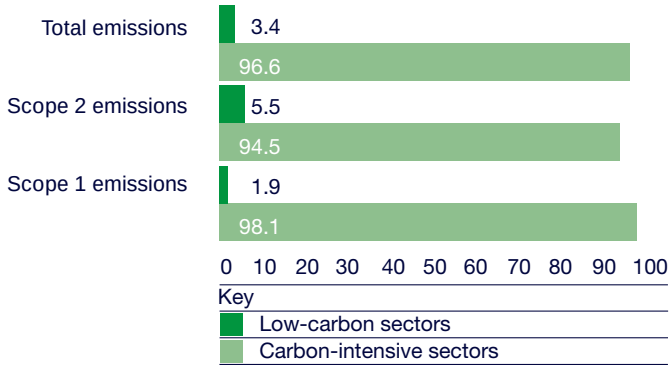


Industrial	23%
Diversified financials	15%
Food and drug retailing	15%
Trading companies and distributors	14%
Food products	11%
Banks	8%
Healthcare providers and services	6%
Remaining other	9%

Note: "Remaining other" includes multiline retail, telecommunications, insurance, real estate, textiles apparel and luxury goods, and IT consulting and services.

Companies categorised as carbon-intensive generate 96.6% of reported GHG emissions (see Figure 12), with low-carbon sectors only generating a 3.4% share. The low-carbon sectors' contribution to the total of Scope 1 emissions was 1.9%, while the low-carbon share of Scope 2 emissions amounted to 5.5%.

Figure 12 – Proportional contribution of carbon-intensive and low-carbon sectors to scope 1 and 2 emissions (%)



Disclosed Emissions by Company

Figure 13 provides an overview of the companies with the largest disclosed carbon footprints, each reporting more than two million metric tonnes of annual CO_2e emissions. For companies that participated in CDP5 (2007), the GHG emissions disclosed in CDP6 (2008) are compared with the companies' reported 2007 emissions. Amongst the twelve represented companies, seven are from the metals and mining sector, demonstrating the high carbon-intensity of this industrial sector.

The two responding paper and forest product companies also ranked high amongst the largest emitters, with *Mondi* and *Sappi* occupying the fifth and sixth place among the high impact companies. The three largest emitters – *Sasol, BHP Billiton* and *Anglo American* – account for approximately two thirds of the total disclosed GHG emissions (67%).

Having relatively high GHG emissions does not automatically suggest that a company's overall performance is particularly carbon-intensive. Higher reported emissions may be a result of a reporting system that is more mature compared to a competitor's system.

Sasol, the only company in the integrated oil and gas sector sampled in this year's CDP6 (2008) is responsible for 32% of the total disclosed Scope 1 and 2 emissions, or 70 million metric tonnes of GHG emissions. The company is therefore the single largest emitter amongst the responding listed companies. By way of comparison, *Eskom* reported total emissions of 223.6 Mt in 2008.[31] (See the *Eskom* case study, Section 6.)

The performance of companies emitting less than two million metric tonnes of CO_2e each is summarised in Figure 14. In total, these companies account for 12,041,553 metric tonnes of disclosed CO_2e emissions. The largest emitters in this low-emitting category are *Exxaro* and *Lonmin*, two smaller carbon-intensive metals and mining companies.

The large differences in GHG emissions disclosed by various carbon-intensive sectors show that the distinction between carbon-intensive and low-carbon sectors might be seen as somewhat arbitrary.

The three largest emitters – Sasol, BHP Billiton and Anglo American – account for approximately two thirds of the total disclosed GHG emissions

"By far the most important reason for the change in our emissions between 2006 and 2007 is the divestment of some of our operating companies, in particular Highveld and Mondi."

Anglo American

"Our total Scope 1 and Scope 2 emissions reported for this reporting period have increased slightly from the last period (less than 0.5% of our total inventory)."

BHP Billiton

30 The trading companies & distributors sector generated 0.4% of the overall reported emissions, or 14% (see Figure 11) of 3% of the total reported emissions.

"Our total global emissions just decreased from 73 Mt in 2006 to 71 Mt in the 2007 financial year. The GHG emissions from our European and American olefins and surfactants businesses were excluded from the 2007 result, because of the possible sale of those businesses."

Sasol

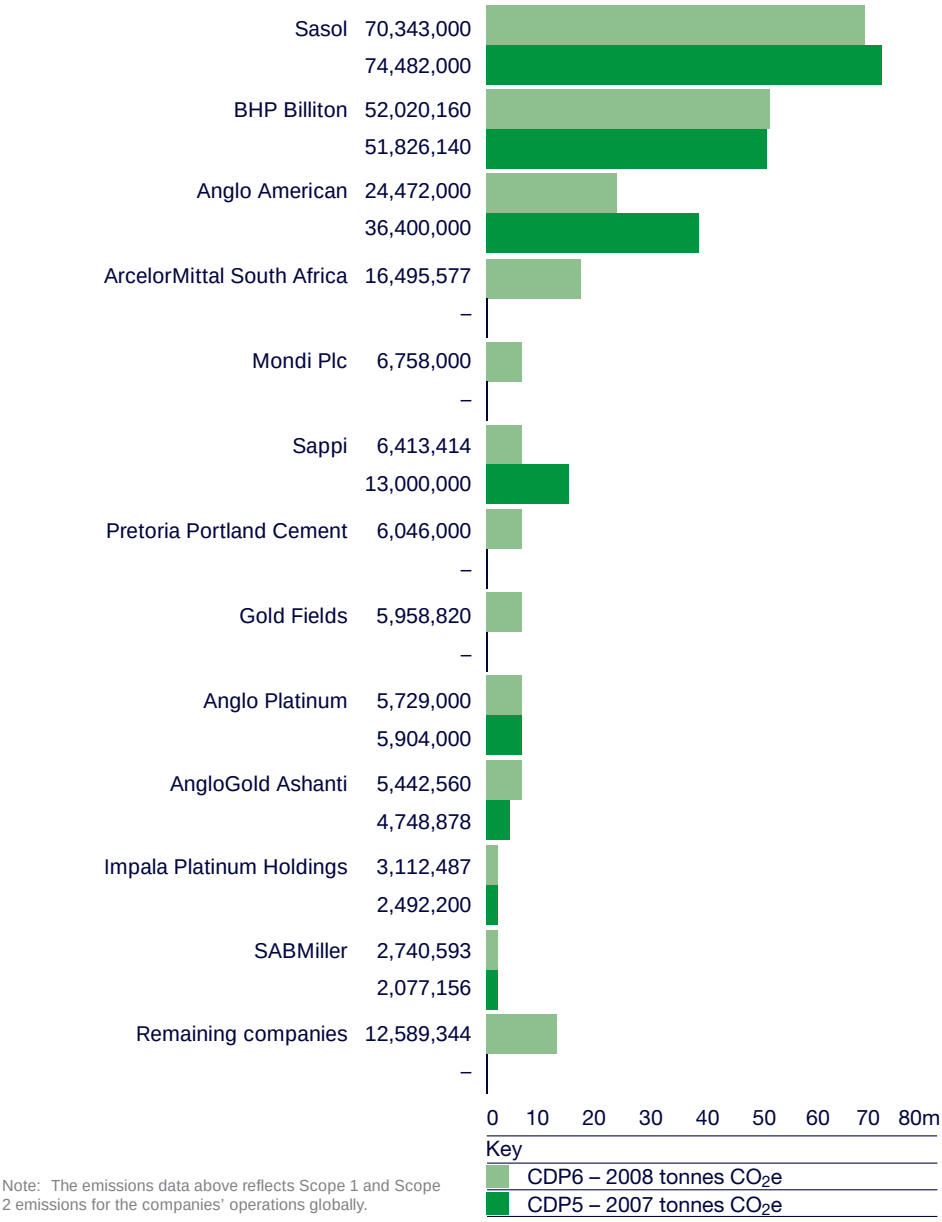
"Northam's scope 1 and scope 2 GHG emissions are predominantly (98%) energy related, with its energy expenditure amounting to 7% of its operational costs."

Northam Platinum

"Scope 2 emissions are currently identified in terms of store electricity consumption in South Africa. Scope 2 emissions account for approximately 96% of calculated emissions."

Massmart

Figure 13 – Companies reporting high emissions (>2 million metric tonnes CO_2e)

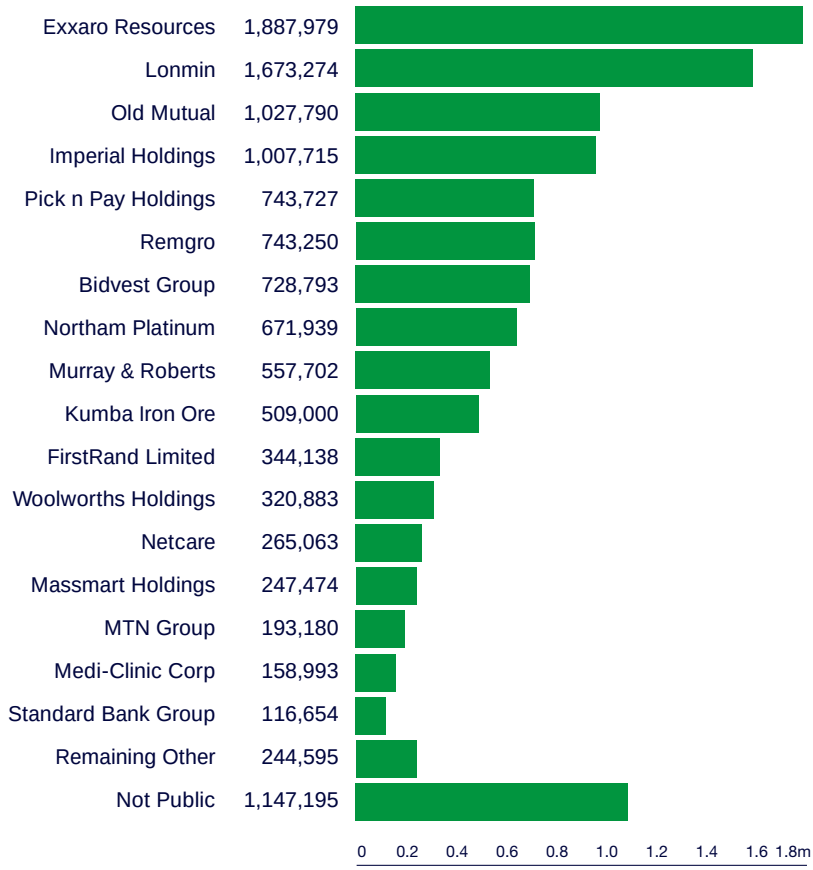


Note: The emissions data above reflects Scope 1 and Scope 2 emissions for the companies' operations globally.

31 Calculated annual figure is based on coal characteristics and coal fired power station design parameters (excluding liquid fuels).

32 The carbon intensity of Eskom's energy has been assessed as 1.02t CO_2/MWh (see Eskom Annual Report 2007). This is significantly higher than, for example, the UK energy carbon intensity average of 0.47t CO_2/MWh (2005 average, compare GHG Protocol calculation tool for emissions from purchased electricity).

Figure 14 – Companies reporting low emissions (<2 million metric tonnes CO_2e)



Note: The emissions data above reflects Scope 1 and Scope 2 emissions for the companies' operations globally. Remaining other includes Nedbank Group, Liberty International, Dimension Data Holdings, Liberty Life Group.

Many companies, such as Northam Platinum, report significant indirect electricity-related emissions (Scope 2). The carbon intensity of the cheap electricity supplied by *Eskom*, the national grid provider, therefore significantly influences the carbon efficiency of companies with large energy requirements and no company-owned generating facilities.[32]

Emissions Disclosure in South Africa – Present and Future

When contemplating the results of carbon disclosures by individual companies, it is important to bear in mind that it is still early days for carbon reporting in South Africa. Despite the high disclosure rate amongst participating companies, the disclosed GHG emissions do not necessarily measure companies' true impact.

A few exceptions aside, most CDP6 (2008) respondents have only recently started to investigate and implement systems and tools to measure or estimate their GHG emissions. Such initial efforts are generally focused on the most significant impact areas within the company and may not yet provide a comprehensive overview of GHG emissions related to the company's operations. With growing experience, and as the companies' systems for measuring GHG emissions become more sophisticated, it can be expected that total reported GHG emissions will rise in the future, as new areas that were previously omitted are taken into account.

"We will continue to monitor the availability of data to allow us to expand our Scope 3 emission calculations in future years."

Dimension Data

"The footprint can only be constructed based on available data, so where data was unavailable, it was not considered in the present calculation."

Liberty International

"This is Massmart's first CDP response in which details of carbon emissions are provided. In this sense, the data provided represents in some instances a broad estimate which we anticipate will be refined in future years."

Massmart

"Pick n Pay's emissions in 2007 were calculated on the basis of fuel usage for our commercial fleet (product distribution and home shopping fleets) and on electricity usage in our stores, but excluded emissions from petrol-powered fleet vehicles and from electricity usage in offices. The 2008 data now include these."

Pick n Pay

"Greater data integrity in business travel information will also result in variations (of reported Scope 3 emissions)."

Woolworths

On average, 60% of the reported GHG emissions were direct (Scope 1), while electricity related Scope 2 emissions accounted for 40%.

"Due to the current status of power supply in South Africa there is an inherent focus on the reduction in electricity wastage and more efficient utilisation."

Absa

Even though the climate change debate is relatively new to South Africans, a number of JSE-listed companies have been considering the issue for several years, due largely to their presence in countries with more stringent climate change regulations. These companies tend to have more sophisticated GHG emissions measurement systems in place than their South African-only counterparts.

Company Emissions by Location and Scope

Comparing global and South African emissions, (see Figure 15 and Figure 16) it appears that non-South African operations are significant contributors to some of the responding companies' total disclosed emissions. For most companies for which comparable data between CDP5 and CDP 6 is available, there has been an increase in total emissions reported for South African operations.

The company with the largest carbon footprint outside South Africa is *BHP Billiton*. Its South African operations account for less than 40% of the group's reported emissions, while last year its GHG emissions outside South Africa amounted to 31.7 million metric tonnes of CO_2e. Conversely, several companies in the group of low emitters do not identify any emissions for operations outside South Africa (i.e. the reported global emissions equal their total South African emissions – see Figure 16).

This may be slightly misleading, as several companies – such as *MTN* and *Pick n Pay* – do not include their international operations in their GHG disclosure. As these companies work to refine and extend their systems and methodologies for calculating their GHG emissions, it is hoped that future reports could represent a more accurate reflection of their global performance and allow for valid comparisons. Table 10 offers some key examples of how companies made exclusions and qualifications for the CDP6 (2008) disclosure as they defined their reporting boundaries.

Figure 15 – Company emissions by scope and location – high emitters (tonnes CO_2e)

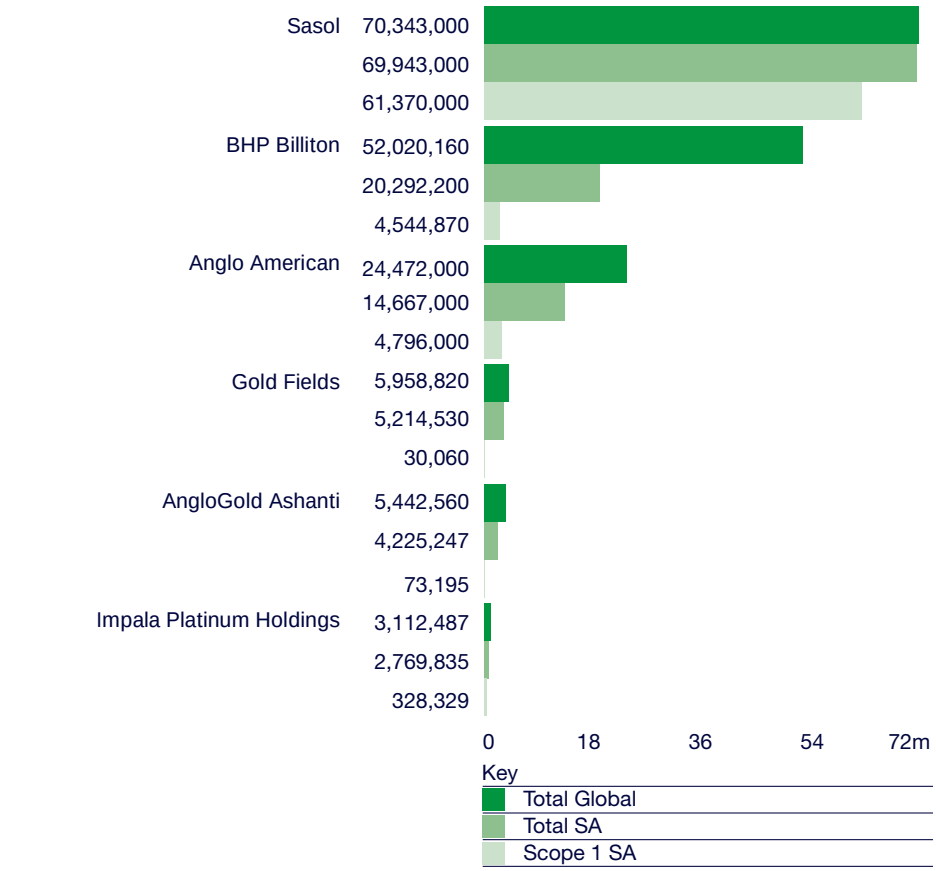
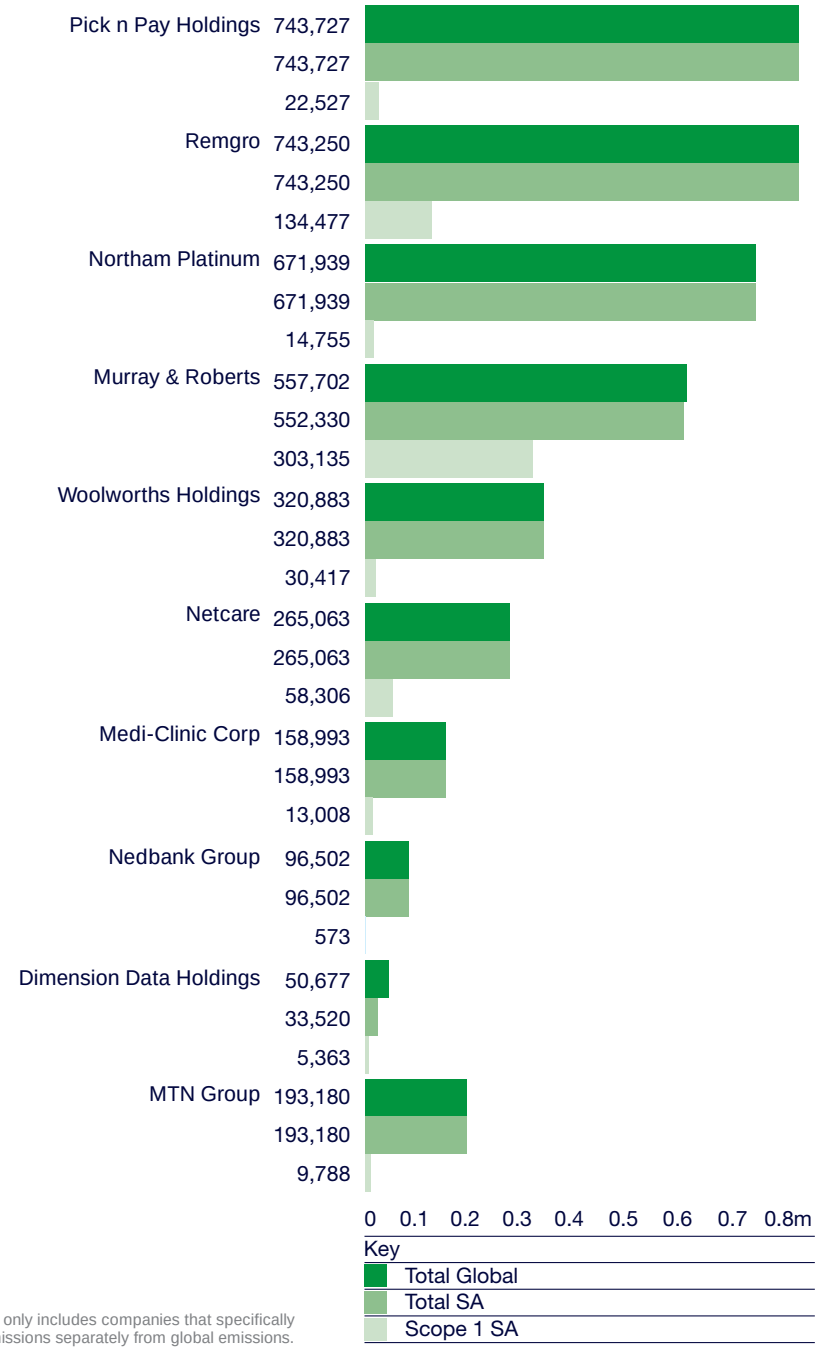


Figure 16 – Company emissions by scope and location – low emitters (tonnes CO_2e)



Note: This figure only includes companies that specifically disclosed SA emissions separately from global emissions.

For the CDP6 (2008) survey, the Scope 3 disclosure of most responding companies is of very variable quality.

"Although important, emissions from many of our operations constitute only a small component of the greenhouses gases associated with the use of our products."

BHP Billiton

"We will continue to monitor the availability of data to allow us to expand our Scope 3 emission calculations in future years."

Dimension Data

"We currently measure Scope 3 emissions arising from business travel, but aim to expand this coverage over the next few years."

Woolworths

"(Our reported) GHG emissions are still partial and not yet verified. At this stage, we believe it would be premature to provide data on emissions intensity."

Truworths International

"Implats is currently focused on the reduction of energy consumption as this is the major contributor to GHG emissions."

Impala Platinum

"Appropriate measurement of emissions intensity varies across sectors, and is generally related to the appropriate production unit for that sector."

BHP Billiton

"We produce a range of products and are aiming to produce intensity metrics on a per tonne basis for each product. We cannot meaningfully aggregate these product intensities to give a (company-wide) intensity metric."

Anglo American

Table 10 – Examples of exclusions and qualifying remarks on reported emissions

Qualifications	
Bidvest Group	"Rough and understated, for indicative purposes only"
Exxaro Resources	Excl. Mineral Sands Operation in Australia
FirstRand	Incl. all divisions and subsidiaries but excl. Outsurance
Liberty Life Group	Incl. some jointly owned assets, but correct for the inclusion by the taking into account the equity share in the asset
Massmart Holdings	In some instances broad estimate (e.g. flights and car emissions)
Medi-Clinic Corp	Excl. operations in Namibia, Switzerland and the Middle East
MTN Group	Excl. operations in 20 countries in Africa and the Middle East (only includes SA data)
Nedbank Group	Incl. 11 head offices = 64% FTE
Pick n Pay Holdings	Incl. South African retail operations only, which constitute about 75% of Group turnover
Remgro	Incl. all its divisions, except the subsidiaries of TSB sugar
SABMiller	Excl. mobile emissions in Scope 1
Sappi	Incl. Northern America and European operations not measured in Southern Africa, but use calculated emission values
Standard Bank Group	Representing 80% of building related emissions for SA operations
Few companies	Measure for 10 months, then extrapolated
Many companies	Note that reported emissions may be incomplete as either not measured or data capture systems still being put in place
Exclusions for quantitative analysis	
New Clicks Holdings	Reported certain emissions but not sufficient for valid comparison
Santam	Reported certain emissions but not sufficient for valid comparison; reported emissions only referred to the Head Office operations (29% of its employees)

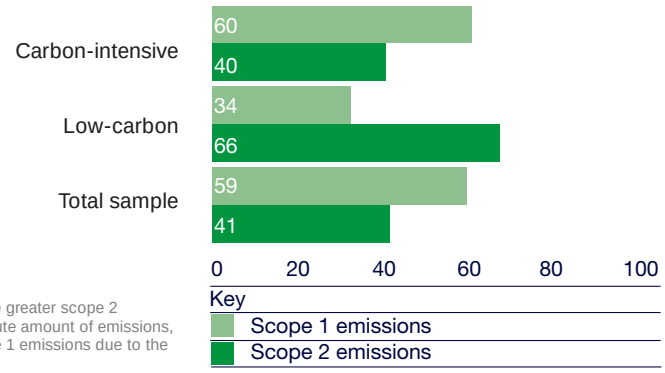
Most companies report higher electricity-related Scope 2 emissions than direct Scope 1 emissions. The only exceptions are *Sasol* and *Murray & Roberts*, for which Scope 1 emissions relative to total emissions amount to 88% and 55% respectively. The companies with the lowest proportion of Scope 1 emissions are *Gold Fields* and *Nedbank* (compare Figure 15 and Figure 16), both reporting Scope 1 emissions of less than 0.6% of their total GHG emissions.

For non-carbon-intensive companies, electricity-related Scope 2 emissions generally represent the bulk of their reported emissions. On average, only 34% of their reported emissions are direct. For the overall responding sample, the average share of reported Scope 1 emissions was 60%, while indirect electricity related emissions accounted for 40% (see Figure 17). The highly carbon-intensive electricity supplied via the national grid by *Eskom* can partly explain the generally large weight of the Scope 2 emissions. Without their own electricity generating facilities, most companies depend on *Eskom's* energy supplies. For these companies, the only way of achieving a material reduction in their total GHG emissions is to reduce their total electricity consumption.

Reporting on "Scope 3" Indirect Emissions

In addition to their direct and electricity-related emissions, responding companies were also requested to disclose their Scope 3 emissions as an option – these refer to the indirect emissions related to an organisation's business operations and products, and include, for example, employee business travel, external logistics, the use and disposal of company products and services, and impacts from the company supply chain.

Figure 17 – Proportional contribution of scope 1 and 2 emissions by carbon impact category (%)



Note: By count, more companies have greater scope 2 emissions than scope 1, but by absolute amount of emissions, the total sample reflects greater scope 1 emissions due to the dominance of Sasol.

In total, 45% of the responding companies provided quantified information regarding their Scope 3 emissions. Most companies focused on employee business travel – the area that generally requires the least complex systems for measurement – but several companies also disclosed emissions data for other areas. In sum, the responding companies identified Scope 3 emissions amounting to more than 334.7 million metric tonnes of CO_2e, the bulk of which originates from BHP Billiton's Scope 3 emissions. These are the effect of the downstream consumption of their coal, petroleum and other products (330 million metric tonnes of CO_2e).

As measuring Scope 3 emissions is inherently complex, disclosure is likely to depend on the sophistication of companies' accounting and assessment tools. Consequently, it is problematic to compare Scope 3 emissions directly between different companies or sectors unless the scoping of included Scope 3 impact areas is taken into account. In this year's survey, the Scope 3 disclosure of responding companies is of very variable quality.

Emissions Intensity Methodologies

In addition to calculating their absolute impact in terms of GHG emissions, companies generally use emissions intensities to assess the relative impact of their operations. Emissions intensities allow for an alternative assessment of a company's emissions performance and are particularly informative for internal comparison over time (if, say, a company changes in size) or external comparison with companies in the same sector. Emissions intensity often refers to emissions per unit of output, but can be any measure that looks at GHG emissions in relation to another critical economic or operational figure (such as company turnover or total number of employees). In general, different intensity measures are suitable for different companies, depending on their line of business, size or strategic focus.

In this year's CDP survey, 77% of the respondents reported having identified an emissions intensity measure for their company, while 9% declared they do not yet monitor their emissions intensities.[33] Amongst the former group, however, several companies specified emissions intensity measures that were in fact absolute measures or energy intensity measures (such as kWh/turnover). While this indicates gaps in the underlying understanding of carbon reporting and measurement, the high percentage of companies responding to this question also suggests that there is willingness to engage on this issue.

Holding companies that have interests in diverse fields of business can find it particularly difficult to identify one particular measure for their emissions intensity. In such cases, it appears most practical to relate carbon emissions to an economic figure such as turnover or earnings before interest, taxes, depreciation and amortisation (EBITDA). Such economic carbon intensities were requested from all responding companies, in addition to the company-specific intensity measure.

Overall, approximately 55% of all respondents reported their emissions intensity as a ratio of metric tonnes of CO_2e and their turnover in

"We currently use metric tonnes of CO_2e emissions per ounce of gold produced. This metric is practical for annual comparisons of performance at the aggregated group level."

AngloGold Ashanti

"To date, the costs of meeting our EU ETS compliance obligations have been met by the economic benefits of our (carbon) trading activities."

BHP Billiton

"Standard Bank will participate in trading schemes around the world to ensure we have global coverage for our client base."

Standard Bank

"Altron recognises that opportunities for generating revenue through carbon credits from CDM projects may exist within the company."

Altron

"Carbon trading under the CDM mechanism presents an opportunity to the company. 84% of the company's gold production comes from developing countries."

AngloGold Ashanti

"Although unlikely, possible future opportunities may arise as a result of the CDM for some Bidvest businesses."

Bidvest

"Northam has conducted a pre-feasibility analysis for a CDM solar project. Further engagement with the CDM will be considered as part of its climate change response programme."

Northam Platinum

"While the scope for CDM projects is limited, there may be an opportunity for a programme of activities where energy savings are accumulated across a range of activities and locations."

Pick n Pay

US$ millions.[34] Unsurprisingly, the emissions intensities of carbon-intensive companies were on average significantly higher than the emissions intensities reported by low-carbon companies, as illustrated in Table 11.

For Scope 1 emissions, carbon-intensive companies report on average an intensity of 1,064 tCO_2e/US$ millions turnover, which is nearly twenty times higher than the low-carbon sectors' average of 26 tCO_2e/US$ millions turnover. For Scope 2 emissions, carbon-intensive companies report an average intensity more than seven times as high as the low-carbon counterparts' average (992 vs. 117 tCO_2e/US$ millions turnover). However, looking at the overall sample of companies that reported their emissions intensity as a ratio of US$ millions turnover, the average Scope 1 emissions intensity is about level with the average company's Scope 2 emissions intensity.

Table 11 – Emissions intensities: metric tonnes CO_2e per US$ millions turnover

	Total sample response rate (%)	Average total sample	Average carbon-intensive companies	Average low-carbon companies
Scope 1	55%	563	1,140	26
Scope 2	57%	554	992	117

Emissions Trading and Clean Development Mechanism Projects

For South Africa as a developing country, the most relevant carbon trading mechanism provided for within the Kyoto Protocol is the Clean Development Mechanism (CDM), a project-based mechanism that encourages developed countries with emissions reduction targets – so-called Annex I countries – to invest in emissions reduction projects in developing countries (such as South Africa).

Although there are currently relatively few successfully implemented CDM projects in South Africa (14 CDM projects are registered with the UNFCCC as at 1 September 2008),[35] South African companies appear to be very aware of the opportunities related to CDM activities. Among the sample of responding companies, 40% reported an involvement or practical interest in CDM projects. While some companies have fully implemented CDM methodologies in place, most companies' involvement is still in the planning phase (10 companies, or 19% of the total responding sample).

The majority of companies considering CDM activities are carbon-intensive companies. Table 12 summarises the different CDM activities and interests disclosed by the respondents, distinguishing between carbon-intensive and low-carbon sectors. In addition to this, two companies with non-public responses mention CDM activities, one of which represents a low-carbon sector. Several other companies report a general awareness of possible opportunities in CDM projects. These non-specific responses were not included in Table 12.

In the European Union, the obligatory Emissions Trading System (EU ETS) has been operational since 2005, forcing companies that produce GHG emissions beyond their fixed annual allowance to purchase additional emissions certificates at the EU ETS carbon market. Companies with surplus emission allowances can in turn sell their excess to generate revenue. Six South African companies – namely *Anglo American, BHP Billiton, Mondi, SABMiller, Sappi* and *Sasol* – report having facilities covered by the EU ETS. With one exception *(Mondi)*, all of these indicated that they were able to sell surplus allowances.

33 The remaining 12% of the responding companies did not respond to the question.

34 Disclosed emissions intensities measured as Scope 1 and 2 emissions per EBITDA are not included in this analysis as it appears that there was considerable ambiguity regarding the appropriate way of calculating this figure (e.g. EBITDA in Rand vs. US$).

35 Details of registered CDM projects are provided at cdm.unfccc.int/index.

Table 12 – CDM activities by sector category and company

Company	CDM activities
Carbon-intensive companies	
Anglo American	• Developed CDM projects at Highveld and Mondi (both now divested) • Developing new projects, several of which are in the process of compiling Project Design Documents (PDDs)
AngloGold Ashanti	• Previously investigated CDM projects were not deemed to be viable • Directive by the CEO to staff to reassess CDM opportunities, with focus areas such as switching to more energy efficient technologies in operations, reforestation and off-mine site revegetation, fuel switching, etc.
ArcelorMittal South Africa	• Five registered projects with CDM at present • Researching numerous other possibilities for future registering
BHP Billiton	• Building a portfolio of CDM and JI credits and EU Allowances (EUAs) to offset any need for EUAs of BHP Billiton assets • Initiative to increase awareness and knowledge of the GHG emissions market and emissions reduction projects at BHP Billiton's assets, to ensure that viable CDM/JI projects are implemented • The company's Energy Marketing Group focuses on managing BHP Billiton's emissions trading exposure (e.g. trialling coal bundled with CER units – raised via CDM projects – to coal customers in Europe)
Exxaro Resources	• Pursuing CDM, energy efficiency, renewable energy and cogeneration projects • A number of CDM projects are being evaluated (e.g. co-generation projects)
Gold Fields	• Actively pursuing CDM projects and developing new methodologies • Successful development of CDM methodology for mine methane capture and utilisation or destruction in mines
Imperial Holdings	• Assessing its current carbon footprint for potential CDM opportunities
Lonmin	• Exploring opportunities in its operations for the use market-based emission reduction mechanisms proposed by the Kyoto protocol (e.g. CDM)
Mondi Plc	• Looking into investment in CDM projects in developing countries • Successful development of CDM methodology in 2007: completion of a bark boiler and installation of a gas turbine at the Richards Bay mill in South Africa
Murray & Roberts	• CDM projects opportunities will be investigated for each operating company, including CISCO (opportunity for process efficiencies, waste heat recovery, alternative fuels) and Oconbrick (fuel switching from coal to natural gas for Clamp kiln furnace)
Northam Platinum	• Has identified a number of potential CDM projects • CDM opportunity of parabolic trough solar considered by management after completed pre-feasibility assessment
Remgro	• Possible CDM projects will be investigated on a per company and per project basis • Examples: Tsb Sugar's expansion of its electricity generating facility, and Rainbow's investigation of electricity generation through combustion of chicken manure
Sappi	• Strategy to explore opportunities where new projects can benefit from CDM funding • First CDM project established at Sappi's Tugela mill
Sasol	• Established committee aimed at optimising the benefits of CERs manages credits on behalf of the Group to ensure proper governance • First CDM project was registered in 2007 at Sasol's fertiliser facilities • Pursuing six CDM projects, with envisaged registration timelines up to 2013
Low-carbon companies	
FirstRand Group	• Targeting CDM projects and will trade environmental credits resulting therefrom
Nedbank Group	• Established a Carbon Credit Origination Team which is currently investigating the South African CDM markets to identify the opportunities for Nedbank
SABMiller	• Operations are encouraged to pursue CDM/JI projects as and where appropriate • Example: An operation in South Africa is reviewing the use of the mechanism to move from coal fired boilers to natural gas fired boilers
Standard Bank Group	• Active in the Kyoto Flexible Mechanisms markets worldwide • Developing new business opportunities in climate change and emissions trading
Woolworths Holdings Ltd	• Investigating certified and voluntary emission reduction methodologies and opportunities for Woolworths facilities and across the supply chain

"We are presently not considering emissions trading from Truworths facilities. Our focus is presently on efficiency and data management, rather than considerations of carbon trading opportunities."

Truworths International

On average, the responding companies spend more than US$ 220 million per year on energy consumption.

"Our focus remains on improving energy efficiency as 90% of our CO_2 emissions are indirect and associated with electricity use."

Anglo Platinum

"As part of an ongoing risk management process, Bidvest divisions are aware that carbon-intensive operations are a growing business liability and, conversely, that carbon and energy-efficient operations are becoming a value-driver providing competitive advantage."

Bidvest

"(Sasol's) energy efficiency projects include: production of steam from waste heat (5 projects); (improvement of) rotating equipment efficiency (4 projects); (reduction of) product losses and flaring (2 projects); (reduction of) electricity consumption (2 projects); and (improvement of) the utilisation of coal (4 projects)."

Sasol

"We foresee that in future the adoption of measures such as these to reduce energy usage will play an increasingly dominant role in consumer perception of our brand."

Pick n Pay

Energy Costs: Energy Efficiency and Renewable Energy

South Africa's current energy supply challenge has forced companies to investigate and better understand their operations' energy consumption and the related costs. Electricity supplied by South Africa's national utility, *Eskom*, still ranks amongst the cheapest in the world (as well as one of the most carbon-intensive). However, *Eskom's* recent supply constraints and scheduled "load shedding", or blackouts, have impacted negatively on the operations of many companies. In response to this energy challenge, many businesses – often in cooperation with *Eskom's* DSM programme – have assessed their energy demand and identified opportunities for increased energy efficiency. Companies therefore tend to have a broad understanding of their energy consumption.

The reported global total of purchased electricity for all responding companies amounted to 348,724,275 MWh, of which 3,659,731 MWh or 1% reportedly came from renewable sources (see Table 13). This global total consumption of electricity by the responding companies is about 45% more than the total electricity consumed in South Africa. This indicates that improved cleaner energy management practices of these companies have huge potential impacts on CO_2 emissions not only in South Africa but also in other countries where they operate. Of the participating companies, 51% disclosed their energy costs. On average, the reported expenditure on energy consumption amounted to US$221,011 per company. The company with by far the largest reported energy expenditure was *BHP Billiton*, at approximately US$2.6 billion, followed by *ArcelorMittal South Africa* (US$933 million) and *Mondi* (US$548 million).

The energy intensity of sectors and companies influences cost structure. Assessing energy costs as a percentage of the company's total operating costs, ArcelorMittal reported approximately 31% as the highest value of all respondents.[36] A low-carbon company with a non-public response reported the lowest value of 0.14%.

In addition to increasing a drive for energy efficiency, recent energy supply deficiencies have also created a significant and growing demand for alternative power supplies, even though these are typically considerably more expensive up-front than *Eskom's* electricity. While most companies initially opted for carbon-intensive diesel generators as an immediate solution to failing power supplies, there is also a significant longer-term interest in renewable energy technologies that allow a degree of general autonomy from national grid supplies. Five companies – namely *AngloGold Ashanti, Gold Fields, Mondi, BHP Billiton* and *Dimension Data* – disclosed spending on energy from renewable sources. *AngloGold Ashanti* reported the highest percentage of energy costs incurred on energy from renewable sources (8.2%).

Eskom cannot yet supply electricity from renewable sources and branded as such. Therefore, these companies must either have company-owned generating facilities in place – designed to use a by-product of the core production process (this is the case with *Remgro* and *Sappi*) – or operate subsidiaries outside South Africa where they source renewable energy from a local energy supplier at a specified price premium (such as with *Old Mutual* and *Bidvest*). Overall, ten companies (19% of responding companies) reported a portion of the electricity they purchase to come from renewable sources (see Table 13).[37] Amongst these, there were five low-carbon companies, one of which stated that as much as 95% of their energy purchases came from renewable resources *(Liberty International)*. This is an indication that energy issues are acknowledged as relevant, independently of the sector or energy intensity of a company.

Table 13 – Companies purchasing electricity from renewable sources (total global MWh)

Company	MWh from renewable sources
BHP Billiton	1,717,300
AngloGold Ashanti	785,983
Sappi	376,981
Gold Fields	309,060
Remgro	168,000
SABMiller	135,000
Liberty International	134,900
Low-Carbon Company (not public response)	16,623
Old Mutual	11,560
Dimension Data Holdings	1,460
Total	3,656,867

Table 14 summarises the renewable energy activities disclosed by 22 responding companies. Companies from both carbon-intensive and low-carbon sectors are pursuing renewable energy solutions. There is a broad variety of reported initiatives, ranging from the development of co-generation and renewable energy technologies *(Exxaro)*, to biodiesel trials *(Anglo American)*, to solar energy initiatives (such as *Lonmin* and *Netcare*). Investments and commitment (purchased or company developed) vary widely. Some have projects up and running, while others are still only at the planning stage. In addition, it is important to acknowledge that some of these initiatives relate to investments in initiatives outside South Africa. Notwithstanding these considerations, this suggests that there is growing awareness of, and interest in, renewable energy technology within the South African business environment. Nevertheless, there remains significant potential for more substantial investment in this area, particularly within South Africa.

In addition to the initiatives summarised in Table 14, several companies are adjusting their business structure to benefit from projected opportunities in the field of renewable energy. *Altron's* subsidiary *Powertech*, for example, has invested in a renewable photovoltaic retailing company; *Nedbank* and *Standard Bank* state a particular interest in working with renewable energy projects, and *Liberty Life* has identified solar solutions as an investment opportunity.

"No renewable energy is currently used, but feasibility studies are underway for a wind farm and a solar thermal power station. A budget of R10m is earmarked for initial investigations in terms of energy efficiency throughout the organisation."

Exxaro

"Approximately 95% of the total electricity purchased is procured from renewable sources."

Liberty International

"Power producers are required to introduce alternate and renewable supplies of energy. These costs could be passed on to consumers, wholly or partially."

Murray & Roberts

"Increased energy efficiency projects are underway and capital is being requested for renewable energy initiatives."

Netcare

36. The insurance company Santam reported an equally high value of nearly 31%; however, this is for the Santam head office where no more than 29% of the company's employees work.

37 One responding carbon-intensive company extrapolated a percentage of purchased renewable energy from data published on the general energy mix supplied by the national grid, which include a small portion of energy from renewable sources. This could not be considered in this analysis since the relevant question referred to energy purchased specifically for its property of coming from a renewable source.

"There is an opportunity to us to potentially expand our use of "clean energy" which could reduce our energy costs per unit as well as avoid costs relating to CO_2 mitigation."

SABMiller

"Climate change has brought with it the realisation that alternative ways of doing business need to be explored and developed to their full potential. The research and development in renewable and alternative energy technologies bears testimony to this."

Sasol

"Unfortunately very few options are available at present for acquiring a reliable renewable energy supply in South Africa."

Woolworths

Table 14 – Renewable energy initiatives by company

Company	Initiative
Carbon-intensive companies	
Anglo American	• Trials of biodiesel at Callide colliery (Australia)
AngloGold Ashanti	• 8.22% of the company's energy costs are incurred on energy from renewable sources • In addition to purchased electricity from renewable sources, the company generated 134,258 MWh of electricity from renewable sources (Brazil) • Completed some small-scale wind power projects (Australia and USA) • Investigations into using hydropower (Brazil)
ArcelorMittal South Africa	• Exploring methods to introduce the use of renewable energy sources into the iron and steelmaking practices • Several registered projects in process of implementation to recover waste heat from metallurgical processes to generate steam in order to generate electricity
BHP Billiton	• Exploring the application of innovative technology to improve renewable energy sources such as solar, wind and geothermal • Strategic agreement with Pacific Hydro to develop one or more wind farms in Chile, with an installed capacity of over 100 MW • 1,717,300 MWh of purchased electricity globally from renewable sources (2.5% of total energy costs)
Bidvest Group	• Bidvest Academy green business projects: Piloting the manufacturing of biodiesel from used cooking oil collected from customers for running the business units trucks, and a project on supplying the building industry with a comprehensive range of renewable energy products • The UK subsidiary 3663 purchases green electricity and uses biodiesel
Exxaro Resources	• Exxaro's Clean Energy Policy: the company will use and develop cleaner technologies like co-generation and renewable energy • Carrying out feasibility studies for renewable energy investments (200 MW solar thermal and 200 MW wind)
Gold Fields	• Generates hydro electricity at some of their operations in Africa • 309,060 MWh of purchased electricity globally from renewable sources (5% of total energy costs)
Imperial Holdings	• Small non-quantified percentage of Imperial's energy costs are incurred on energy from renewable sources • Certain of their logistics operations use bio-fuels
Lonmin	• Commissioned a study to replace the mines water heating facilities (5-10% of total usage) with solar water heating technology • Considering large solar power generation for new expansion projects
Mondi Plc	• Mondi's 2007 energy vision: Aim to increase the proportion of own-produced power and the overall share of energy from renewable sources • Investing in the technology needed to use own-produced renewable fuels (e.g. biomass, black liquor, sludge, and tall oil) • 41% of Mondi's total energy is from biomass – a percentage which has remained stable over the past three years and which the company aims to increase • Selling sustainable-produced energy via renewable energy support schemes in the Czech Republic and Poland in Austria, a hospital is using Mondi's excess low-temperature heat following an investment by the local authority
Northam Platinum	• Use of hydro power and backfill supports at the Northam Mine • Leverages pioneering of renewable energy to secure discounted prices from technology providers • Off-grid alternative energy solutions are currently under investigation for the Northam mine extension and the Booysendal project
Remgro	• Subsidiary Tsb Sugar's annual electricity generation from bagasse: 168,000 MWh • Subsidiary Rainbow Chicken runs an electricity-from-manure project which is in pilot project phase
Sappi	• In South Africa, more than 40% of the company's energy needs are met by renewable energy from biomass fuel generated by internal processes (black liquor) and forestry operations (forest slash and bark) • Some of Sappi's operations buy biomass as a fuel source
Sasol	• Biofuels research (renewable resource for liquid fuels) • Established a group which will concentrate on opportunities associated with renewable and alternative energy technologies and solutions

Table 14 – Renewable energy initiatives by company *(continued)*

Company	Initiative
Low-carbon companies	
Dimension Data Holdings	• 1,460 MWh of purchased electricity globally from renewable sources (2% of total energy costs)
FirstRand	• Solar energy is used for geysers and other water warming facilities • Considering the use of renewable energy sources
Liberty International	• Satisfies most of its electricity supply requirements from renewable sources • 134,900 MWh of purchased electricity globally from renewable sources (95% of total electricity purchased)
Netcare	• Capital is being requested for renewable energy initiatives (solar pilot in particular) • Piloting of a solar water heating system at one facility in 2002 was unsuccessful
Old Mutual	• UK offices operate on electricity from renewable energy sources
Pick n Pay Holdings	• Sourcing of renewable electricity is being investigated • May extend its product range to include products associated with renewable energy
SABMiller	• Purchased 135,000 MWh of electricity from renewable resources (18,295 MWh of which were purchased in Annex B countries)
Woolworths Holdings	• Investigating renewable energy to meet their goals around "carbon neutral store/s" • Woolworths' Sustainable Building Strategy considers solar powered water heating

Emissions Reduction Targets

Companies worldwide have started to acknowledge the need to reduce their GHG emissions and have set themselves targets to improve their performance. This is the desirable response to climate change issues, translating measurement efforts into measurable corrective action. Several South African companies have also begun to formalise their emissions reduction efforts in this way.

Emissions reduction targets generally form part of emissions reduction plans that provide an over-arching strategic approach. Amongst the respondents to the CDP6 (2008) survey, 45% of the respondents indicated having an emissions reduction plan; however, only 23% (12 companies) disclosed specific company-wide GHG emissions reduction targets (see Table 15).[38] Another, *Sappi*, which does not have company-wide targets, however did report emissions reduction targets for operations outside South Africa. *Unitrans*, an international subsidiary of JSE-listed *Steinhoff*, reported the most ambitious relative target aiming for an annual 10% reduction in total carbon emissions on a 2008 baseline.[39] Most of the companies with dedicated targets are in carbon-intensive sectors (nine companies). *Nedbank*, *Woolworths* and another company (response not public), stand out for being low-carbon companies that have established clear emissions reduction targets.

Table 15 – Company-wide carbon emissions reduction targets by company

Company	Targets
Anglo American	10% reduction of CO_2 emissions per unit of production by 2014 (2004 baseline)
Anglo Platinum	10% reduction of CO_2 emissions per unit of production by end 2014 (2004 baseline)
AngloGold Ashanti	30% reduction in GHG emissions per ounce produced ("medium- to longer-term target")
BHP Billiton	13% reduction in GHG emissions intensity by 2012 (2006 baseline)
Gold Fields	2% reduction per annum in emissions over the next 5 years (2007 baseline)
Kumba Iron Ore	10% reduction in CO_2 emissions by 2014 (2004 baseline)
Lonmin	5% reduction of GHG emissions by 2012 (2007 baseline)
Mondi Plc	15% reduction in total CO_2 emissions by 2014 (2004 baseline)
Nedbank Group	12% reduction in carbon emissions intensity by 2015 (2007 baseline)
Sasol	minimum 10% reduction in GHG emissions per tonne of product by 2015 for Sasol globally (2005 baseline)
Woolworths Holdings	30% reduction in relative amount of carbon produced directly by the business by 2012 (2007 baseline)

"Northam already leverages pioneering of renewable energy and energy efficiency technologies to secure discounted prices from technology providers."

Northam Platinum

"We are ready to be held accountable for our carbon production and to demonstrate our plans to achieve reductions in both energy use and the emissions of the six greenhouse gases."

SABMiller

"Much of the energy reduction in 2007 corresponds to a significant reduction in our use of gas, which dropped by 16% on the previous year; this can be attributed to a combination of the relatively mild weather accompanied by active energy management of our lighting, plant and equipment."

Liberty International

Several South African companies have begun to formalise their emissions reduction efforts and set themselves targets to improve their performance.

An international subsidiary of Steinhoff reported the most ambitious relative emissions reduction target, aiming for an annual 10% reduction in carbon emissions on a 2008 baseline.

Only 23% of the responding companies have developed specific GHG emissions reduction targets.

All companies with genuine emissions reduction targets also pursue reduction targets for their energy consumption.

"Emissions intensity targets are set in accordance with DEAT and are specified and regulated in each licence issued in terms of APPA or NEMAQA."

African Rainbow Minerals

Several companies reported an energy-related reduction target as their emissions reduction target. Only two companies (*Pick n Pay* and *Sappi*) that had identified energy consumption targets as emissions reduction targets expressly explained why they consider these emissions reduction targets.

In the light of the current electricity crisis in South Africa, it appears that emissions reductions are only a secondary motive for company-wide energy reduction targets. While this does not reduce their practical relevance with regard to reduction planning, this suggests that energy-related reduction targets are not quite the same as emissions reduction targets.

Table 16 summarises the disclosed company-wide energy-related reduction targets, distinguishing between carbon-intensive and low-carbon companies. Some of these disclosed energy reduction targets appear to be particularly ambitious.

In the metals and mining sector, for example, some of the envisaged energy consumption improvements appear very challenging in the light of the expected growth path of the companies, as well as the more onerous mining conditions that may require more energy-intensive mining procedures.

Several companies referred in their CDP6 (2008) responses to multi-stakeholder targets such as the Energy Efficiency Accord (EEA) and *Eskom's* national 10% reduction target. Two companies with energy-related reduction targets noted that they did not have emissions reduction targets in place *(Absa*, and *Pretoria Portland Cement)*. All companies with genuine emissions reduction targets also pursue reduction targets for their energy consumption. In addition to emissions and energy reduction targets, *Nedbank* reported intensity reduction targets for water and paper consumption.

Table 16 – Companies disclosing energy-related reduction targets

Company	Targets
Carbon-intensive companies	
Anglo American	15% increase in energy efficiency by 2014 (2004 baseline)
Anglo Platinum	15% reduction of energy consumption by 2014 (2004 baseline)
AngloGold Ashanti	15% reduction in energy consumption per ounce of gold produced ("short- to medium-term target"), 4.5% of which were to be achieved in 2008 (2007 baseline)
ArcelorMittal South Africa	10% reduction in electricity and ultimately energy consumption by 2015 (2007 baseline)
BHP Billiton	6% reduction in carbon-based energy intensity by 2012 (2006 baseline)
Exxaro Resources	15% reduction in energy consumption by 2015 (2007 baseline)
Gold Fields	EEA target: Investigating 15% reduction in energy consumption by 2015 (2000 baseline)
Impala Platinum Holdings	EEA target: Investigating 15% reduction in energy consumption by 2015 (2000 baseline)
Kumba Iron Ore	15% reduction in energy consumption by 2014 (2004 baseline)
Lonmin	1.5% reduction in energy consumption per unit of production for 2008, and 10% reduction of aggregate energy consumption per unit of production by September 2012 (2007 baseline)
Mondi Plc	15% reduction in specific energy consumption by 2014 (2004 baseline)
Pretoria Portland Cement	EEA target: Investigating 15% reduction in energy consumption by 2015 (2000 baseline)
Sappi	EEA target: Investigating 15% reduction in energy consumption by 2015 (2000 baseline) for South African operations
Sasol	15% improvement in energy intensity by 2015 for Sasol's South African operations (2000 baseline)
Low-carbon companies	
Absa Group	EEA target: Investigating 15% reduction in energy consumption by 2015 (2000 baseline)
Nedbank Group	12% reduction in energy intensity by 2015 (2004 baseline)
Pick n Pay Holdings	20% reduction in electricity consumption by 2012 (2007 baseline)
Truworths International	Responding to Eskom's national target of 10% reduction in energy consumption
Woolworths Holdings	30% reduction in relative electricity consumption by 2012 (2007 baseline)

Activities to Reduce Emissions

As companies pursue emissions reduction targets and manage longer-term energy and carbon related costs, they typically begin to improve the performance of their operations. Among the responding companies, a broad number reported undertaking activities in order to facilitate emissions reductions. However, the scope of the outlined activities varied greatly depending on the line of business and the size and strategy of the different companies. Several companies used generic descriptions (such as energy demand management) without describing how they practically aim to achieve GHG emissions reductions. It appears that the companies' efforts are not always guided by a dedicated reduction programme or overarching policy.

Table 17 provides an overview of 14 companies that reported specific activities and identified related emissions and energy reductions. Companies from the carbon-intensive metals and mining sector clearly demonstrated how and to what extent, identified reduction efforts affect their GHG emissions performance.

Despite the considerably less carbon-intensive nature of their businesses, several low-carbon companies also report clear carbon and energy management activities and achievements. While again this may in part be attributable to the constrained energy situation in the country, it can also be considered as a sign that GHG emissions may grow to become a competitive issue, particularly in the client-and consumer-orientated service industry. Rising environmental awareness levels among the South African public and possible regulatory guidelines may further increase the profile of corporate emissions reduction activities in the future.

Table 17 – Emission reduction activities by company

Company	Projects/activities	Emissions reductions
Carbon-intensive companies		
Anglo Platinum	Energy-saving projects, e.g. • Compressed air management • High-pressure grinding roll technology • Energy-efficiency lighting	• Energy-efficiency lighting: saving of 5.5 MW (=50,000 t CO_2e)
AngloGold Ashanti	• Energy efficiency initiatives	• 17% energy reductions since 2004 and a proportionate reduction in emissions
ArcelorMittal South Africa	• Total cost of ownership project to identify total use of fossil fuels and identify opportunities to decrease dependency and secure supply • Registered projects in process of implementation to recover waste heat from metallurgical processes to generate electricity (e.g. turbines (2008, 2010, 2012) and waste gas driven power station (2011))	• Expected reductions: 2.5 Mt of upstream CO_2e emissions
BHP Billiton	• Power factor correction at the Cannington site • Steam dump valve replacement to stop steam bypass at the Kalgoorlie Nickel Smelter • Density control on the concentrate underflow to the drier at the Kalgoorlie Nickel Concentrator • Exploring application of innovative technology	• Power factor correction: ~15,000 t CO_2e • Steam dump valve: ~11,000 t CO_2e • Density control: ~ 3,000 t CO_2e

"Nedbank supports long-term regulatory action around the setting of clear and mandatory, medium and long-term emission reduction targets, building on the existing framework, as well as adopting goals and incentives for renewable energy production."

Nedbank

"The target will be determined at the end of the 2008 reporting year based on the reduction obtained after the first year of GHG emission intervention."

Netcare

"Specific targets for energy reduction have not yet been set, although we are responding to the national 10% energy reduction objective by Eskom."

Truworths International

38 Since the response of one company disclosing an emissions reduction target was not public, Table 15 summarises the targets of 11 companies only.

39 This target is not included in the table summarising reported emissions reduction targets as it refers to one subsidiary of Steinhoff only, and therefore does not qualify as a company-wide target. Also, note that according to Unitrans, this target may be adjusted for acquisitions and disposals.

"At present our focus has been on head office and to some extent, Truworths Distribution Centre. In the coming year, the activity focus will extend to retail outlets."

Truworths International

"Woolworths has conducted awareness programmes, campaigns and presentations at stores for the last 25 years to educate staff about efficient use of energy."

Woolworths

"The rapid change in raw material and energy costs has made the quantification of the effects of our efforts very difficult, and while we remain convinced that we have made significant improvements, we are not confident in publishing details yet."

Sappi

"Future emissions and energy use have been forecast in order to support our carbon-based energy and GHG emissions intensity targets."

BHP Billiton

Table 17 – Emission reduction activities by company *(continued)*

Company	Projects/activities	Emissions reductions
Carbon-intensive companies		
Bidvest Group	• Introduction of Ammonia-Gylcol refrigerant systems • Efficient lighting • Ongoing vehicle-routing optimisation • Specific initiatives by 3663 (e.g. use of biodiesel, converting of trucks to lowest CO_2 output engines available, purchasing green electricity, and implementation of employee car-sharing policies)	• Refrigerant system: Reduction of 1.3 million kWh/£67,500 (two year period) • Lighting: 750,000 kWh (£53,825) • Vehicle-routing: £50,000
Exxaro Resources	• Development and use of cleaner technologies like co-generation and renewable energy (e.g. planned investment in a wind farm and a solar thermal power station installation) • Modification of coal washing plants, which are designed to be zero-effluent plants • Energy Efficiency Projects	• Annual saving of 1,450 MWh or R347,000 expected to be possible at the head office
Mondi Plc	• Improving operational efficiencies and substituting fossil fuels with carbon-neutral biofuels • Increasing the overall share of energy from renewable sources	Between 2004 and 2007: • 6% reduction in total CO_2e emissions from fossil fuels • 3% improvement in energy usage per tonne of product produced
Northam Platinum	• Using hydro-powered cooling water system in a deep underground mining system • Use of backfill to reduce cooling requirements underground • Marginal land is being maintained as a game farm, with natural vegetation	• Hydro-powered cooling water system: reduced consumption in grid purchased electricity • Use of backfill: reduced energy use
Remgro	• Tsb Sugar: Generation of electricity from bagasse the orchards of subsidiaries absorb and store carbon • Rainbow: Pilot project on electricity generation from chicken manure Wispeco: Introduction of energy efficient lighting.	• Wispeco: Electricity saving of 5%

Emissions Planning

As discussed earlier, a number of companies responding to the CDP6 (2008) survey have established targets for the reduction of their energy consumption and GHG emissions. For companies to develop suitable targets, it helps to project their future consumption and production patterns. Among the responding companies, 32% indicate that they currently forecast their future emissions and/or energy use.

Carbon-intensive companies mostly pursue carbon and energy forecasting activities. A comparison between three significant low-carbon sectors (banks, diversified financials, insurance) and the three dominating carbon-intensive sectors (metals and mining, steel, integrated oil and gas) confirms this trend: of the latter group, 60% are forecasting their carbon emissions, while only 8% of the low-carbon group engaged in forecasting activities. Yet, the overall sample of companies that currently forecast their emissions and/or energy use also includes four low-carbon companies (*Medi-Clinic, Nedbank, Woolworths* and one non-public response).

Companies generally do not specify emissions forecasts but work with generalised estimates based on historical data and the assumption that their business will neither significantly grow nor reduce in size. Only three (carbon-intensive) companies disclose concrete numeric projections for their future performance (*AngloGold Ashanti, ArcelorMittal* and *MTN*). The disclosed projections, are, however, limited to particular indicators and do

Table 17 – Emission reduction activities by company *(continued)*

Company	Projects/activities	Emissions reductions
Low-carbon companies		
Absa Group	• Power factor correction to be implemented at all high consuming areas • Implementation of the Watts Down initiative (lighting retrofit and usage control, geyser control) • Modernisation of lifts • Energy centre at Johannesburg Absa Towers West building will use gas for electricity production	• Power factor: target financial savings of 20% • Watts Down: Aims to save 100,000 MWh per month • Lifts: target energy savings of 20% • Energy Centre: target energy savings of 15%
FirstRand	• Initiative for reduced energy consumption as part of a DSM Project with Eskom • Eco-friendly building features for new WesBank office building	• 9,535 t less CO_2e • 87 t less sulphur dioxide • 38 t less nitrogen oxides • 3 t less particulate
Liberty International	• Energy efficiency initiatives and activities • Guidelines for new developments and buildings	UK Shopping Centres: • 7% reduction in energy use from 2006 levels • 58% waste reused through recycling or energy from waste
Medi-Clinic	• Energy management initiatives • Implementation of ISO-14001 standards and principles • Hoogland Medi-Clinic pilot project with Eskom and the North West University investigates a cost effective model for hospitals	• Hospital with ISO-14001 certification uses on average 40,000 kWh less energy per month than uncertified hospitals • Hoogland project: aims to reduce energy costs by 10%
Woolworths Holdings	• Energy-saving initiatives, in particular for lighting and air conditioning systems • Pilot programme utilising new refrigerant technology in food stores • Support of "greening projects" for offsetting • No air-conditioning in Woolworths stand-alone food stores (except in KZN) • Sustainable building strategy for building design and development (e.g. award-winning Midrand Distribution Centre) • Recycling of used cooking oil to generate a 5% biodiesel mix in part of their fleet	• New refrigerant technology: 35% decrease in electricity usage • 800 trees planted as part of a "greening project" • Biodiesel: saving of 1,500 t CO_2e per annum • New central distribution centre: saving of 9,370 km of road travel

not provide a comprehensive forecast of the overall emissions performance of the company. In general, the different responses to the CDP6 (2008) suggest that current climate change related forecasting activities in South Africa are largely focused on energy related aspects.

While forecasts of GHG emissions and energy demand can help the ongoing management of companies, they can also be relevant in the decision processes around new investment and expansion plans. Recognising climate change as a risk to their operations and longer-term success, several companies responding to the CDP6 (2008) survey stated that they include climate change considerations in the risk assessment that they routinely conduct before making any major investment decisions. The projection of increased costs related to the potential introduction of climate change regulations and rising energy prices can affect the attractiveness of certain investment opportunities. Conversely, climate change and related issues can also motivate for additional investments, such as energy efficiency programmes and renewable energy or CDM projects. This is particularly relevant for companies in carbon-intensive businesses.

"As part of Dimension Data's developing Carbon Management Plan, the company will determine appropriate methodologies for forecasting future emissions. Once our plan has been finalised, estimates of future electricity consumption and business travel mileage will become part of our regular forecasts and enable us to monitor and minimise the emissions that result from either."

Dimension Data

"We do not currently forecast our future emissions or energy use. However, we do set reduction targets over three yearly periods and assign a budget for improvements, e.g., investments in energy efficiency."

Liberty International

40 This percentage excludes three companies that consider their data to be "externally verified" as it is calculated by an independent entity. The outsourcing of emissions calculation services, however, cannot be considered to replace the verification process.

41 When reported information and figures were evidently incorrect, the respective responding companies were encouraged to amend their response. If amendments were provided, they were considered in the CDP6 (2008) report.

"Massmart lacks the systems and data to (forecast the company's future emissions and energy use) at the present time. We do however appreciate the importance of forecasting emissions and are working toward achieving this."

Massmart

"The actual emissions are not forecast, but Medi-Clinic is aware of the fact that recent acquisitions will increase its overall carbon footprint."

Medi-Clinic

"Many factors affect the costs of future emissions. Regulatory restrictions, fossil fuel prices, wood costs, and electricity prices has to be considered. These factors are in a potential state of flux due to Kyoto negotiations in Europe and other local regulations, so it's impossible to project future emissions accurately."

Mondi

Verification and Accuracy

While the trend of increasing emissions disclosure among responding companies is encouraging, data reliability in many cases remains to be addressed. The emissions data of only 25% of the responding companies has been externally verified.[40] As South African companies have started to put growing emphasis on carbon reporting, it can be expected that this rate will increase for CDP (2009). Several companies currently already conduct internal audits of emissions data.

Among the responding companies, 47% have a system in place to assess the accuracy of GHG emissions inventory calculation methods, data processes and other systems relating to GHG measurement. However, few companies are able to provide inclusive information on the systems they use. Most companies cover only particular aspects to ensure GHG data accuracy, and do not look at data collection, data management and calculation methods simultaneously. The responses to the CDP6 (2008) questionnaire show that the emissions data quality management of some companies needs refinement, as some of the provided answers proved incorrect.[41] As GHG measurement becomes more established in South Africa and companies gain in reporting experience, it is likely that companies will put a stronger focus on systems that ensure the reliability of their data.

Emissions History

Of the responding companies, 23% indicated that their emissions reported for CDP6 (2008) vary significantly compared to previous year. The most frequently quoted reason was an adjustment of the scope of the reporting process, enlarging it to include emissions contributors that were previously omitted and hence making it more accurate. Considering that many of the companies participating in CDP6 (2008) disclosed their GHG emissions for the first time, it can be expected that such variances will be repeated in next year's disclosure. While the refinement of carbon monitoring and reporting is a positive trend, such efforts impede the comparability of emissions data of companies over time and complicate the assessment of carbon reduction achievements.

Divestment and investment decisions also bear a significant impact on the reported GHG emissions. Furthermore, changing weather conditions were quoted to influence companies' GHG emissions. Two low-carbon sector responses trace reduced reported carbon emissions to successful energy reduction programmes (*Liberty International* and one non-public response).

Climate Change Governance

Within climate change governance, the two key questions that companies responded to most comprehensively were regarding "responsibility" and "public policy". In the former, disclosure on which board committee or executive body has overall responsibility within the company for climate change was made. In the latter category, companies reviewed the extent to which they engage with policy-makers on possible responses to climate change, including taxation, regulation and carbon trading. In the question on "individual performance," few companies reported having incentive mechanisms for individual management of climate change issues.

Responsibility for Climate Change Management

This year, international trends across nearly all CDP expansions indicate a sharp increase in the number of companies that address climate change at a board level, with a noticeable increase in the extent to which board members have been allocated responsibility for climate change. In South Africa, there has been a similar overall increase in the number of companies that are addressing climate change at the board level, 81% for CDP6 (2008) vs. 61% for CDP5 (2007).

However, this result needs to be considered in perspective. It appears that in many South African companies the overall responsibility for climate change lies with the executive board, as this leading management body is generally in charge of risk-related management issues. Categorising climate change as a risk, the CEO and the executive

board therefore also address climate change as part of their responsibilities. It is positive if the CEO and the leading management committee are directly involved and responsible for their companies' climate change management. However, if frontline management is not as engaged as top-level management, then responsibility at the highest level will be ineffective.

Internationally, companies – some with very positive results – have focused on the following five action areas to integrate climate change in their governance practices and strategic planning:[42]

- *Board oversight* – In this area, the board has oversight responsibility for environmental affairs and conducts periodic reviews of climate change. It also monitors progress in implementing strategies. International companies that offer positive examples in this area include *Anadarko Petroleum* and *Dow Chemicals*.
- *Management execution* – Here, the chair or CEO of the company clearly articulates the company's view on climate change and GHG control measures. In addition, executive officers are in key positions to monitor climate change and co-ordinate response strategies and executive officers' compensation is linked to the attainment of environmental goals and GHG targets. International companies that have done well in this governance area include *Alcoa* and *United Technologies*.
- *Public disclosure* – In this area, companies disclose their climate risks and opportunities in their securities filings and other public documents. Sustainability reports also offer comprehensive and transparent presentations of company response measures. *DuPont* and *Ford* are among the companies that feature highly in this area.
- *Emissions accounting* – Here, companies calculate and register GHG emissions savings and offset these from projects. They also conduct annual inventories of GHG emissions from operations and publicly report results. In addition, companies set an emissions baseline by which to gauge future GHG emissions trends. Examples of international companies that have featured positively include *General Motors*.
- *Emissions management and strategic opportunities* – In this last area, companies set absolute GHG emission reduction targets for facilities and products and participate in GHG trading programmes to gain experience and maximise credits. They also pursue business strategies to reduce GHG emissions and minimise exposure to regulatory and physical risks. *Edison International* and *Weyerhaeuser* are among the companies that stand out here.

Among those companies regarded as global leaders in climate change, three common governance practices have emerged:[43]

- Boards of directors and senior executives work together to address climate change and other sustainability issues
- CEOs regard climate change as a near-term priority and are speaking out on climate policy, risks and opportunities
- Management teams pursue practical solutions to climate change rather than waiting for breakthrough technologies

There are several examples of companies that have an executive body taking overall responsibility for climate change:

- In the metals and mining and the steel sector: *Anglo American, Anglo Platinum, AngloGold Ashanti, ArcelorMittal, BHP Billiton, Exxaro, Gold Fields, Impala Platinum, Kumba Iron Ore, and Northam Platinum*
- In the financial services sector: *Absa, FirstRand, Nedbank, Santam and Standard Bank*

"We forecast future energy usage based on an analysis of future trading space, new stores to be opened, energy efficiency interventions being implemented and logistics planning."

Woolworths

Only three (carbon-intensive) companies disclose concrete numeric projections for their future carbon performance.

Climate change and related issues can motivate for additional investments, such as energy efficiency programmes and renewable energy or CDM projects.

Few companies were able to provide inclusive information on the systems they use to assess the accuracy of GHG emissions inventory calculation methods, data processes and other related systems.

42 See reference: Cogan DG, Corporate Governance and Climate Change: Making the Connection. Ceres, 2006.

43 See footnote above.

The most frequently quoted reason for significant changes in companies' reported emissions was the improvement of the reporting process, including emissions contributors that were omitted in the previous year.

"The emissions reported for our last accounting year vary significantly compared to previous years as new and additional emitting activities were included in our 2007 GHG calculations."

Nedbank

"The 2006 and 2007 data reported to the CDP vary markedly. This is because a more exhaustive list of energy sources has been included in the 2007 submission."

AngloGold Ashanti

"Pick n Pay's emissions in 2007 … excluded emissions from petrol-powered fleet vehicles and from electricity usage in offices."

Pick n Pay

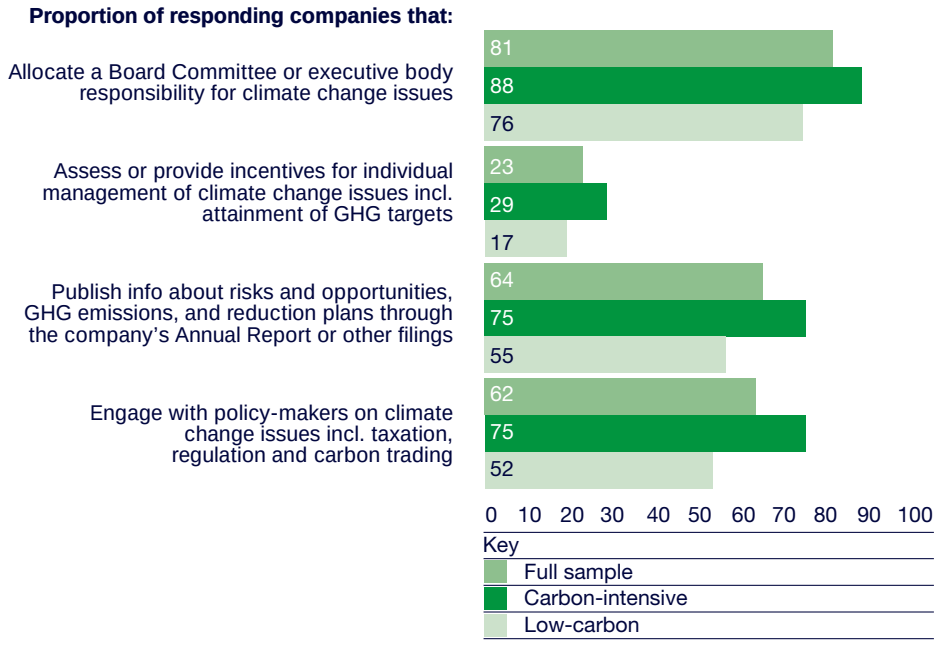
- In the retail sector: *Massmart, New Clicks Holdings, Truworths International and Woolworths*
- In other diverse sectors: *Bidvest, Dimension Data, Imperial, Medi-Clinic, Mondi, Murray & Roberts, Netcare, Pretoria Portland Cement, Remgro, SABMiller, Sappi* and *Sasol*

When analysing both the responses to questions regarding "Responsibility" and "Public Policy," it is encouraging that more companies are addressing climate change at the board level. However, there is clearly still a key weakness among South African corporates – as was also identified in last year's CDP – in understanding the regulatory implications of climate change. In addition, there is an important gap when it comes to public policy in that there is little current evidence of collaborative partnerships.

Public Policy and Partnerships

Positive action as regards respondents' public policy around climate change is mostly – but not exclusively – indicated by those companies that are dual-listed and that rank highly in this year's CDLI (both for carbon-intensive and low-carbon sectors). Such action includes engagement with policy-makers, government departments and industry forums in areas including regulation and carbon trading. A small proportion of these companies have taken a collective approach to engaging more broadly beyond government departments and policy-makers.

Figure 18 – Response trends of companies to responsibility, public policy and communication (%)



To address climate change effectively, companies need to take on a collective approach in collaboration and partnerships. This ought to focus on engagement going beyond policy-makers, government departments and industry forums to interactions and collaborations with both critics and peers. These kinds of partnerships could include non-governmental organisations (NGOs) and environmental groups (such as the *South African World Wide Fund for Nature (WWF-SA)*), as well as engagements with the company's supply chain and other companies and business representative bodies (such as the NBI).

Several South African companies have explored partnerships in the environmental and social fields, some of them from early on and increasingly following CSI pressures. There is, therefore a culture of engagement in South Africa among corporates. However, the depth of this engagement needs to be questioned. Most companies are still approaching engagement as a "check-box" exercise, rather than probing what they might learn from these organisations. In addition, there are very few engagements on climate change specifically, mainly because companies have not yet clarified their own "learning" opportunity from the climate change issue and because there are few NGOs that have the capacity to collaborate on these issues.

Many companies tend to use the words "partnership" and "collaboration" lightly – without necessarily appreciating the depth of exchange, mutual trust and learning that must accompany such an initiative.

Select Top JSE 100 companies that have adopted a collective approach to partnerships include *Anglo American, BHP Billiton, Kumba Iron Ore, Liberty Life, Massmart, Mondi, Nedbank, Pick n Pay, Sappi, Sasol* and *Woolworths*. Two partnership initiatives that stand out include *Liberty International's* partnership with the *UK Carbon Trust* and *Nedbank's* Conservation Partnership with the *WWF-SA*.

A review of existing examples of climate change collaborations and partnerships among JSE Top 100 companies is provided in Table 18.

There is still a key weakness among the Top JSE 100 companies in understanding the regulatory implications of climate change, and little evidence of collaborative partnerships.

If companies are to address climate change effectively, there needs to be a more collective approach, which focuses on engagement going beyond policy-makers, government departments and industry forums to collaborative partnerships with both critics and peers.

While there is currently a culture of engagement among South African corporates, the depth of this engagement needs to be questioned. Most companies are still approaching engagement as a "check-box" exercise. In addition, there are very few engagements on climate change specifically.

"Sasol participates as a South African representative on the international Carbon Sequestration Leadership Forum (CSLF). At these meetings valuable information on pilot projects from more than 20 countries are shared."

Sasol

"Liberty International is working with The Carbon Trust and a major specialist consultancy in calculating the carbon footprint for its shopping centres. The next stage is to work with the Trust to influence energy efficiencies at each property."

Liberty International

"Nedbank is committed to improving the management of energy and GHG emissions across our businesses and have set energy and GHG emissions intensity reduction targets in line with our commitments under the EEA and our Conservation Partnership with WWF-SA."

Nedbank

Table 18 – Examples of JSE Top 100 Companies' climate change collaborations and partnerships

Company	Grouping	Country
Anglo American	• Global Legislators' Organisation for a Balanced Environment (GLOBE)	International
	• Confederation of British Industry	UK
	• World Coal Institute	International
	• International Emissions Trading Association	International
	• International Chamber of Commerce	International
	• Australian Business Climate Group	Australia
	• Carbon Sequestration Leadership Forum	International
AngloGold Ashanti	• Engagements through business associations and the Department of Environmental Affairs and Tourism	South Africa
	• Chamber of Mines of South Africa	South Africa
	• Business Unity South Africa	South Africa
	• National Mining Association	International
BHP Billiton	• BHP's Climate Change policy commits the company to work with governments and other stakeholders on the design of efficient climate change policies	International
	• BHP supports research, development and demonstration programmes into low emissions technologies. Examples: Coal 21, Australia (2007-2015); FutureGen Industrial Alliance, United States (2007-2012); Cooperative Research Centre for Greenhouse Gas Technologies, Australia (2002-2012); and Cooperative Research Centre for Coal in Sustainable Development, Australia (2007-2012)	Australia and US
Dimension Data Holdings	• Recent appointment to Cisco's Global Channels Green Council	International
	• Participation in the Green Grid	International
Exxaro Resources	• Member of Chamber of Mines of South Africa	South Africa
	• Energy Intensive User Group South Africa	South Africa
	• Participates in Fossil Fuel Foundation	South Africa
FirstRand	• Participates at an industry forum consisting of representatives of most of the major financial institutions of South Africa	South Africa
Gold Fields	• International Council of Minerals and Metals (ICMM)	International
	• Energy Intensive User Group South Africa	South Africa
	• Signatory to the National Energy Efficiency Accord (EEA) with the Department of Minerals and Energy	South Africa
Massmart Holdings	• On-going round table discussions with government, academics and representatives from civil society covering a wide range of sustainability issues	South Africa
Murray & Roberts	• Participation in meetings with the Designated National Authority (DNA) to understand the registration and development of the CDM project process in South Africa	South Africa
	• Participated in 2nd India-Brazil-South Africa Summit	International
Nedbank Group	• Signatory to the National EEA	South Africa
	• On-going interactions with various business leaders to ensure a pro-active involvement in the creation of a climate change policy for South Africa	South Africa
Pick n Pay Holdings	• Participates in dialogue sessions between government and business leaders as part of South Africa's Long-Term Mitigation Scenario to discuss responses to climate change	South Africa
Sappi	• Represented on the Pulp and Paper Industry of South Africa and signatory to the National EEA	South Africa
Sasol	• Involved with the South African National Committee on Climate Change	South Africa
	• Participates as a South African representative on the Carbon Sequestration Leadership Forum with the South African government	International
	• Sasol is part of a national committee tasked to assess the functionality of the DNA to ensure the effective running of the DNA office and facilitate CDM project growth in South Africa	South Africa
Woolworths Holdings	• Signatory to the National EEA	South Africa
	• Named "Responsible Retailer of the Year" in the 2008 World Retail Awards in Spain	International

5

Eskom: A Brief Case Study

This section provides a case study of Eskom, South Africa's electricity supply utility. Eskom is a significant player when it comes to South Africa's GHG emissions, reporting 223 million metric tonnes of CO_2e emissions in its 2008 financial year. This figure is almost three times that of South Africa's second highest corporate emitter, Sasol, and the utility accounts for approximately half of South Africa's total emissions.[44] This high emissions intensity is a result of the company's generating capacity being approximately 90% coal-based due to South Africa's abundance of low cost coal.[45]

Although the amount of CO_2 that we emit will increase in the short to medium term, we are committed to assessing options to retard that rate of increase and, ultimately, begin to decrease it…
This will be done by investing in lower carbon-emitting technologies as these technologies become available and meet the feasibility requirements.[47]

Eskom

"Our capital expansion plan provides a significant opportunity to change our energy mix and this can be achieved by increasing the nuclear, gas, renewables and clean coal components."[50]

Eskom

Eskom, South Africa's electricity utility, is a parastatal – its share-holder being the South African government. As it is not listed, the company has not been included as part of the official scope of this or the previous CDP report. Eskom, has, however, chosen to participate voluntarily in the CDP South Africa for two years running. The company has been reporting voluntarily on its emissions in its annual report for more than 10 years.

Utilities the world over are investing in new capacity in order to meet rising demand for energy in both the developing and developed economies. The lack of clear post-2012 international climate policy decisions is cited by utilities as making these long-term fixed investment decisions extremely difficult. However, it is clear that in many countries, coal will continue to play an important role as a power generating fuel throughout this century, and some utilities are pinning their hopes on carbon capture and storage in order to mitigate the risk of GHG regulations.

Whilst historically supplying electricity at one of the lowest prices in the world, Eskom is currently facing supply-side capacity constraints due in part to a decade of strong growth in the South African economy. There are a number of options for meeting this capacity gap, but given local resources and options, it is likely that it will predominantly be met through a combination of coal and nuclear.[46] Correspondingly, the price of South Africa's electricity is anticipated to rise threefold over the following decade partially to finance this investment.

Eskom's Climate Change Disclosure

The South African CDP team approached Eskom requesting its input to the CDP report. Eskom's response to this request has been used to provide the content for this case study. The study draws on Eskom's current and previous response to the CDP questionnaire, as well as on its publicly available annual reports. It is most encouraging that Eskom has volunteered a response to both the CDP5 (2007) and CDP6 (2008) reports.

Recognising the Risks and Opportunities

Eskom recognises that climate change represents a key risk for the company, given that its energy mix comprises such a high proportion of coal, and that "economically viable and technologically suitable alternatives to coal are limited in South Africa." Eskom discloses that uncertainty in the climate change debate is a critical consideration, given the long expected life of the majority of electrical plants. Eskom's climate change strategy (outlined further on in this section) reflects how the company understands the impacts of climate change on its business and people and how it pro-actively manages these impacts.

Adaptation to the impacts of climate change is an important element in Eskom's project design and investment decision-making. Water is cited as the most significant physical risk from climate change, and a principal risk to Eskom's operations. Short-term adaptation measures include dry cooling in the company's new power stations, which is anticipated to reduce water consumption by approximately 90%. Eskom already operates two of the world's largest dry cooled power stations (Kendal and Matimba). Adaptation and mitigation are reported as often involving trade-offs. Technology to reduce water use, such as dry cooling, results in a loss of the plant's efficiency, which in turn leads to higher emissions. Extreme weather events are also disclosed as an issue, with the potential to affect severely the performance of wet-cooled power stations, transmission and distribution infrastructure, line and thermal efficiency and the operation of hydroelectric plant.[48]

Diversifying the energy mix is recognised as a paramount long-term opportunity to ensure a reduction in Eskom's emissions. Renewable energy sources being evaluated include wind, solar, wave, tidal, ocean current, biomass and hydro.[49] The wind and concentrating solar power elements are the most advanced and the development and introduction of projects is underway. Clean coal technologies are already being applied to Eskom's coal-fired power stations under construction.

44 South Africa's estimated emissions for 2004 were 440 million metric tonnes, as quoted in the South African government's LTMS for Climate Change October 2007).

45 Eskom's voluntary CDP6 (2008) response.

46 Eskom Annual Report 2008.

47 Eskom Annual Report 2008.

48 Eskom Annual Report 2007.

49 Eskom Annual Report 2006.

50 Eskom Annual Report 2008.

51 Calculated annual figure is based on coal characteristics and coal fired power station design parameters (excluding liquid fuels).

52 Revenue of R44 448 m from Eskom 2008 Annual Report.

53 Although Eskom's generating capacity is all within South Africa, it imports and exports electricity from and to neighbouring states (currently Eskom imports more than it exports); this has implications for Scope 3 emissions reporting.

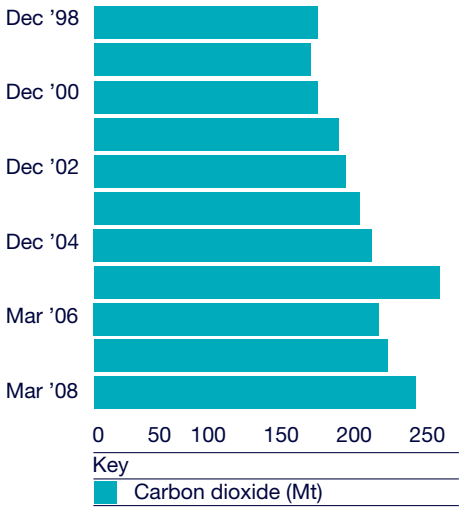
Eskom will seek to improve the resilience of its infrastructure and workforce by incorporating adaptation issues into long-term planning and risk mitigation strategies.

Eskom's Climate Emissions

Eskom disclosed an increase in its level of CO_2e emissions this year, from 208.9 Mt in 2007, to 223.6 Mt in 2008.[51] This increase is mainly due to the increased quantities of coal burnt and electricity produced, a reduction in the company's average coal calorific value and an overall drop in thermal efficiency of its power stations. Its current emissions intensity (in terms of electricity sold) is 1 kg/kWh. In terms of revenue, Eskom's emissions intensity is 34,800 tCO_2e per US$1 million in revenue based on its 2008 figures.[52]

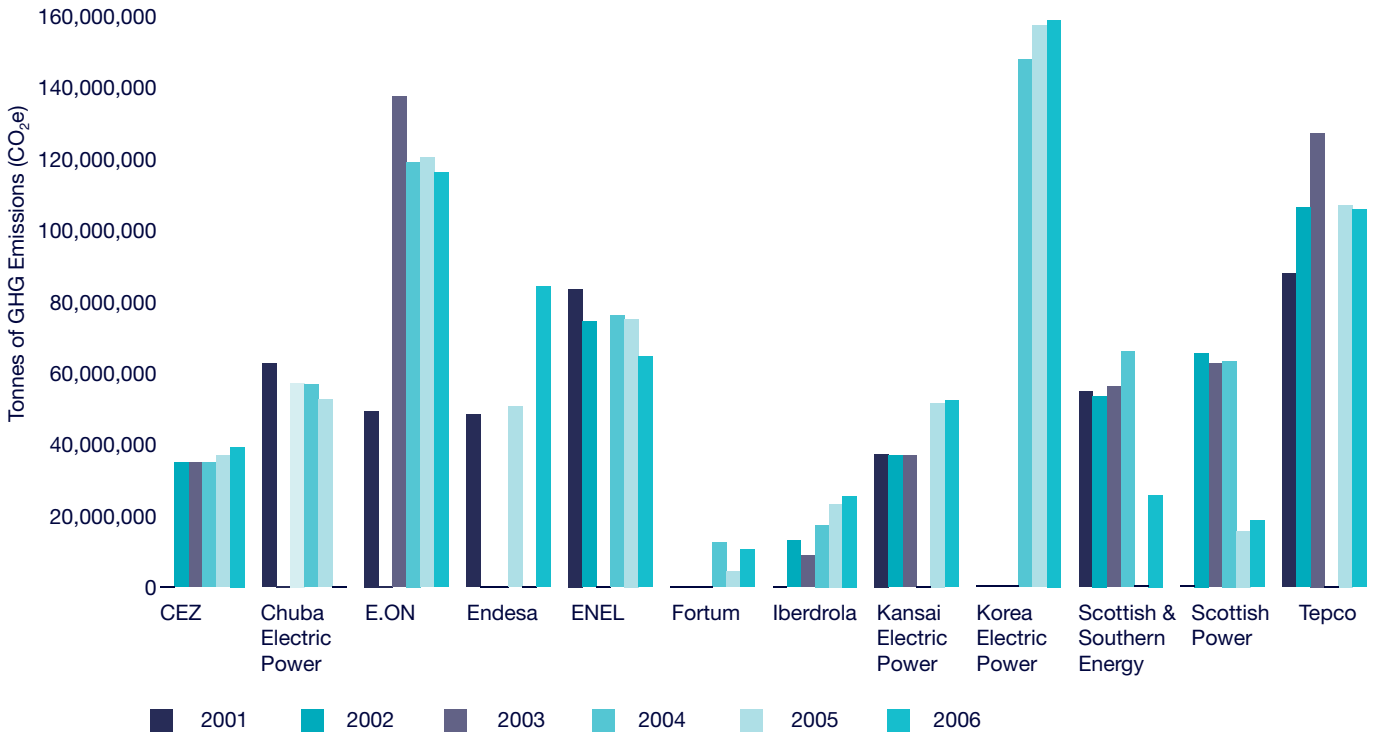
Eskom does not distinguish between direct and indirect emissions in its disclosure; nor does it distinguish based on countries of operation.[53] Emissions data is calculated based on quantities of coal used. The data is internally audited and all information that is included in the annual report is externally audited. Emissions have been climbing over the past decade, as the South African economy has grown, and Eskom's generating mix has remained unchanged because the country had excess electricity capacity and was therefore not building any new plants. The company projects a future medium-term increase in emissions, followed by reduction, as it diversifies its energy mix.

Figure 19 – Eskom's actual CO_2e emissions in Mt[54]



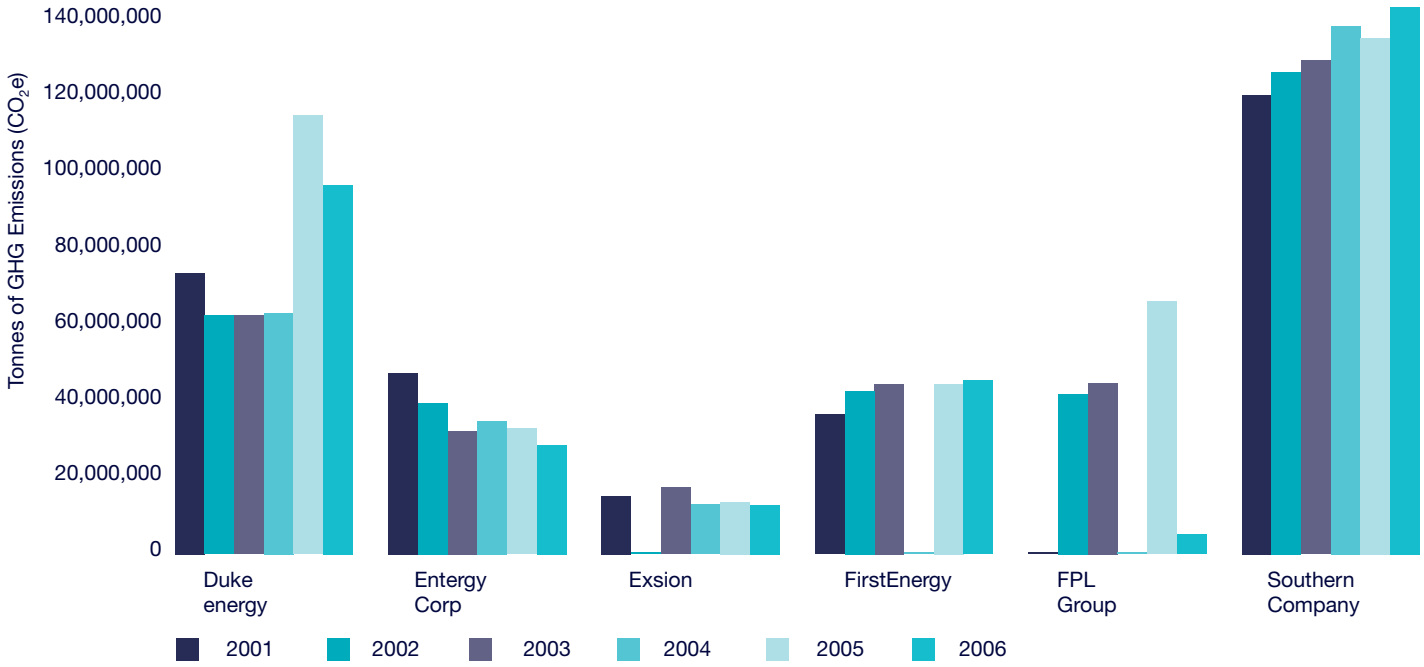
The following graphs from the 2007 CDP report provide a sense of how Eskom's emissions compare with the international electric utilities that participated in the Global 500 CDP5 (2007).

Figure 20 – GHG emissions in international electric utilities (participating in CDP)



54 Eskom's CDP6 (2008) voluntary response.

Figure 21 – GHG emissions in US electric utilities (participating in CDP)



"We plan to reduce coal's current approximately 90% share of the energy mix to below 70% by 2026. To achieve this, a much higher proportion of nuclear energy (currently 4%) is envisaged by 2026, while additional renewable energy options (about 2% by 2026) will also be pursued."[55]

Eskom

Eskom's Climate Change Strategy and Investment

Eskom's commitment to reduce its GHG emissions is embodied in the implementation of its climate change strategy. This is summarised in a six-point plan:

1. Diversification of the generation mix to lower carbon-emitting technologies
2. Energy efficiency measures to reduce demand and GHG and other emissions
3. Adaptation to the negative impacts of climate change
4. Innovation through research, demonstration and development
5. Investment through carbon market mechanisms
6. Progress through advocacy, partnerships and collaboration

Responsibility for sustainability issues – including climate change – has been allocated to the board-level Sustainability Committee (SC), and the Executive Committee Sustainability and Safety Sub-Committee (SSSC).

Given the long-term nature of the electricity supply business, supply side change is slow. Eskom's emissions are anticipated to rise in the short to medium term, until changes to the generating mix in the medium to long-term result in emission reductions. Key parameters are being set for intended reductions in relative CO_2e emissions until 2025, and thereafter, continual reduction of emissions in absolute terms. This will be done by investing in lower carbon-emitting technologies as these technologies become available and meet the feasibility requirements.

In the short term, Eskom will focus on energy efficiency for demonstrable progress. This includes an internal energy efficiency programme that aims to save a billion kilowatt-hours and efforts to influence electricity usage patterns of electricity consumers through the DSM programme. Eskom's energy efficiency programme aims to save 3,000 MW by 2012 and 8,000 MW by 2025. This is equivalent to two units of a typical six-pack power station.

Long-term Emissions Reduction Possibilities

Long-term diversification plans include increasing the nuclear component of the grid by up to 20,000 MW by 2025, and increasing the renewable component to at least 1,600 MW in this timeframe.

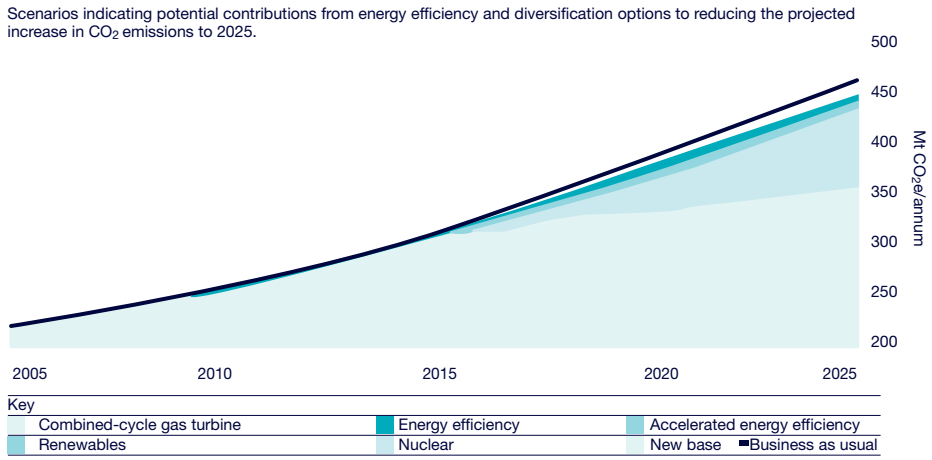
Eskom has decided to invest in a 100 MW wind facility in the Western Cape which, subject to necessary approvals, could be in operation by 2010. It has also initiated the national rollout of solar water heating and compact fluorescent lamp (CFL) programmes. Feasibility studies are underway to determine the viability of establishing a 100 MW pilot concentrating solar power (CSP) plant in the Northern Cape Province.

Eskom has modelled the potential contribution of demand- and supply-side initiatives to the future reduction of its CO_2e emissions. A possible future scenario up to 2025 is illustrated in Figure 22, indicating the potential contribution of the various energy efficiency and diversification options.

"Nuclear technology will play an important role as a replacement for coal as a base load option; it provides significant cuts in greenhouse gases and is an attractive option in terms of energy security."[56]

Eskom

Figure 22 – Potential contribution of demand- and supply-side initiatives to the future reduction of Eskom's CO_2e emissions



Note that the technical and financial viability of these options is continually being re-assessed.

Eskom reports that in the longer term (to 2050) it is conceivable to achieve absolute reductions in the metric tonnes of CO_2e it emits, as it replaces existing coal-fired power stations with lower carbon emitting technologies. The following two graphs demonstrate two possible combinations of diversification options that reduce CO_2e emissions below 2007 levels in this longer-term. They show a projected relative contribution of energy efficiency and diversification options to the reduction of CO_2e emissions. Research is regarded as the key platform for the development and deployment of new carbon-reducing technologies. Technology road maps are being developed to guide research and optimise resources.

These and longer-term scenario plans are continually re-assessed.

Pilot projects currently being undertaken by Eskom include: an underground coal gasification pilot that can improve efficiency, reduce environmental impacts and possibly provide a mechanism for the sequestration of CO_2 – a "System Johansson" gasifier biomass pilot for small-scale applications; and hosting the development plant for the pebble-bed modular reactor project, which incorporates modular nuclear technology. Plans include a 100 MW concentrating solar thermal plant that may overcome the barrier of intermittency and support a local economy

55 Eskom Annual Report 2008.
56 Eskom Annual Report 2008.

Key

Technology	Reference case	Scenario A(B)*
Efficiency	Load growth 4.4% per year to 2026 2.5% (no efficiency) to 2050	Reduces expected growth in annual demand by estimated 0.23%
Renewables	900 MW wind by 2026, 2 GW by 2050	4.5 GW wind plus 8.5 (30)* GW solar by 2050
Nuclear	No new nuclear	40 (30)* GW by 2050 20 (10)* GW by 2026
Hydro imports	No new imports	17 GW by 2050
Clean Coal	Supercritical (36%)	41% (2025) 45% (2030) 47% (2035)
Capture & Storage	None	All new coal plant from 2035

( )*Indicates Scenario B

Figure 23 – Possible combinations of diversification options – Scenario A

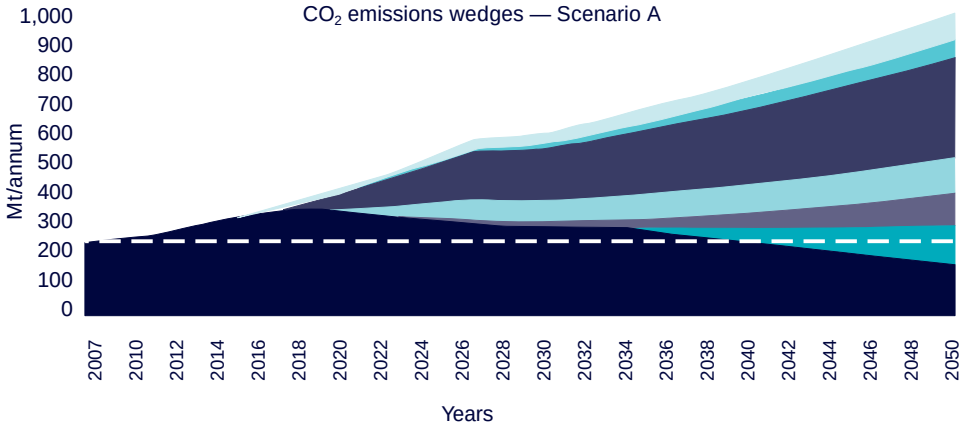
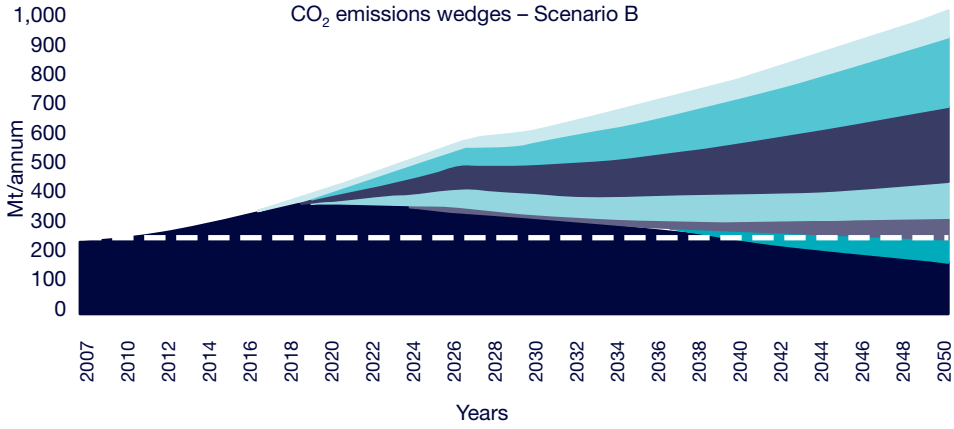


Figure 24 – Possible combinations of diversification options – Scenario B



"The carbon market is an essential mechanism to level the playing field by making technologies more accessible and, in turn, inviting sustainable investment into developing countries. We are participating in the CDM and view it as a good vehicle to bridge some of the cost gaps, as well as for the wide-scale deployment of low carbon-emitting technologies. We are also investigating the application of programmatic CDM in our DSM portfolio."[57]

Eskom

Integrating Climate Change into Investment Evaluations

Eskom uses an integrated decision making process for investments that includes a discussion of climate change trade-offs. In the last year, Eskom has developed a shadow price for carbon, for investment evaluations, that will assist with its efforts to diversify towards lower carbon-emitting technologies and ensure that longer-term issues are taken into consideration in decision-making. Currently mechanisms such as the CDM, aimed at reducing the additional cost of mitigating climate change, do not meet these additional costs although this is expected to change in the future.

Eskom has also completed a carbon trading strategy that looks at the management of carbon credits. The company says an important aspect for business is more certainty in the carbon-trading market after 2012.

Eskom has calculated the South African electricity-grid emission factor for use in its CDM projects and has created a CDM page on its website where the information required to do this calculation is provided for other project developers to use.

Climate Change Partnerships

Internationally, Eskom interfaces with leading global organisations that address aspects such as emissions trading, policy directions, post-2012 scenarios, leading research and business collaboration. Climate change partnerships include the 3C (Combat Climate Change) initiative, the World Business Council for Sustainable Development (WBCSD) and the International Emissions Trading Association (IETA). Locally it participates in the South African government's LTMS process, the South African National Committee on Climate Change (NCCC) and the NBI's EEA. Eskom has also initiated Climate Change Business Dialogue in partnership with the NBI.

57 Eskom Annual Report 2008.

6

Climate Change and Business: Some Local Perspectives

This section provides some different perspectives on Climate Change by the South African CDP sponsors, each of which were invited to provide their assessment of, or response to, the business implications thereof.

In spite of the increasing global awareness, it is of great concern that the South African signatories only include two banks, one insurance company and two asset managers, including Frater Asset Management (FAM). The investment and financial sectors are vital to leveraging an appropriate response to climate change given their ability to specify the terms on which capital is made available.

Frater Asset Management

Until very recently, the South African institutional investment community and the business media have treated climate change predominantly as an environmental issue, generally failing to appreciate the profound economic and business significance of the issue. This is beginning to change, with the business media increasingly reporting on the financial and developmental aspects of climate change, and with some (though perhaps still too few?) players in the local institutional investment community beginning to factor climate considerations into their investment decisions.

Climate Changes Your Business

Commentary by KPMG (Project Sponsor of CDP South Africa)
Climate change no longer needs an introduction. It is widely regarded as one of the most serious challenges the world faces, with consequences that go far beyond its effect on the environment. The physical impacts of climate change, increasing consumer awareness and stricter legislation means that businesses are increasingly confronted with the implications. As a result, the subject is steadily moving up companies' agendas as companies recognise that climate change poses both risks and opportunities, with strategic and financial implications for their organisation.

A recent review by *KPMG International* brings together and analyses research on the effects of climate change on the corporate world. The review, entitled *Climate Changes Your Business* is based on a review of 50 authoritative published studies addressing the business risks and economic impacts of climate change at a sector level. The study aggregates the findings of these 50 reports and quantifies the level of climate related risks facing a wide range of business sectors. In addition, with the help of observations from 11 external experts, the review assesses the degree to which that aggregate view is realistic. The result is both an overview and a critical appraisal of climate-change risks, as they are currently perceived.

Key findings of the KPMG International Review

- *Business risks and economic impacts remain underestimated*

  The *KPMG* review reveals that whilst science and economic analysis offer an ever-clearer picture of the global macroeconomic impacts of climate change, in the absence of hard data, the nature and extent of the climate change risks to business remains far from clear. Little is known about which parts of economies are exposed to risk and therefore there is a need for further analysis at sector level. The study suggests that many reports, while emphasising the opportunities arising from climate change, underestimate the risks faced by specific sectors. This focus on opportunity over risk is striking in the light of a growing consensus on the significant macroeconomic costs of climate change, which inevitably have implications for companies. Interestingly, previous research conducted by *KPMG* and the Global Reporting Initiative also found that companies reported significantly more on potential opportunities than the financial risks of climate change.

- *Four types of climate-change risks identified*

  The *KPMG* review further finds that climate change can expose companies to four types of risk – regulatory, reputational, physical and litigation risks – and that these risks are likely to increase in the future. The level of importance attached to each type of risk differs considerably both across sectors and regions. Furthermore, these risks are materialising regardless of the actual rate of climate change, gaining a dynamic pace of their own.

- *Regulatory risk most commonly cited*

  Of the four, regulatory risk was the most commonly cited, with 72% discussing this as the most pressing risk currently facing businesses. Companies and sectors that fail to adjust to a changing business environment created by new laws and regulations face competitive disadvantages, while regulatory uncertainties make it difficult for companies to plan.

- *Physical risk: full analysis of impacts lacking*

  Half of the reports analysed for the *KPMG* review address the physical risks of climate change. However, the majority of these refer exclusively to the direct impacts of weather-related events. There is little discussion on the potential indirect and longer-term risks.

- *Risk to reputation and litigation underestimated*

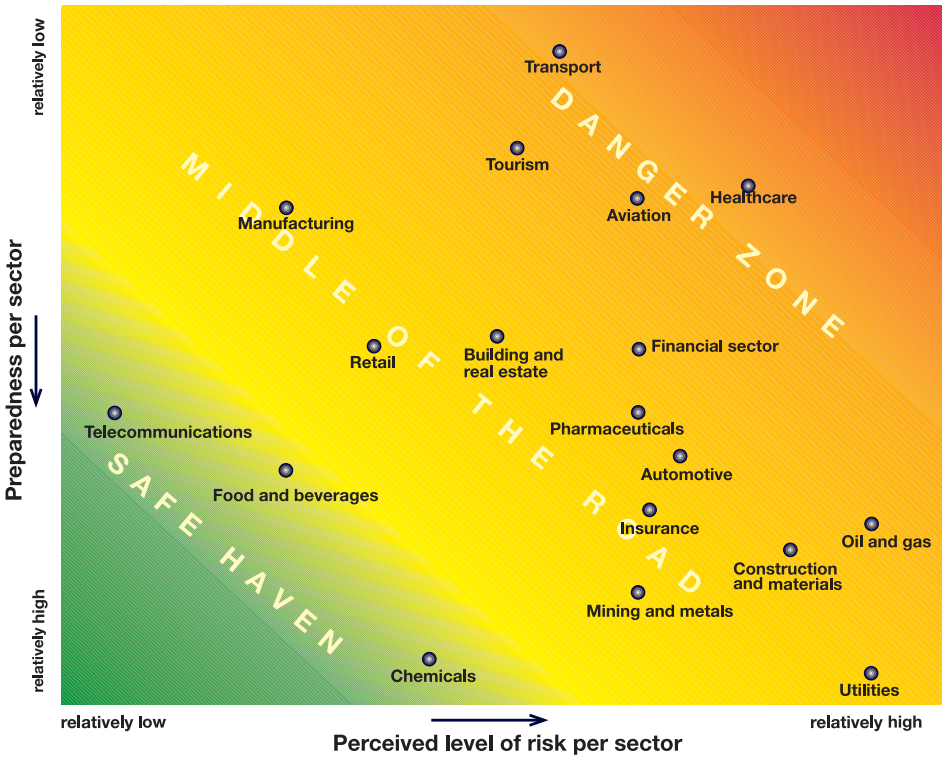
  Relatively few of the reports pay attention to reputational and litigation risks (28% and 14% respectively). Although the scale and scope of such risks seems to be growing, they do not yet seem to be considered substantial. However, the review highlights a growing risk of litigation to companies in the United States and identifies a bigger risk to corporate reputations than the reports suggest.

- *Most sectors at risk – but preparedness varies greatly*

  For the purpose of further analysis, *KPMG* classified sectors as belonging to one of the three following categories:
  - Danger zone: sectors where risk is markedly greater than preparedness
  - Middle of the road: sectors where risk is roughly matched to preparedness
  - Safe haven: sectors that seem to be reasonably well prepared for climate change and that do not seem to face significant risks

The review reveals that almost every sector is exposed to at least one of the four types of climate risks, with risk levels considered high or medium. Considerable discrepancy between sectors is revealed when the perceived level of risk is plotted against "preparedness" for the effects of climate change.

Figure 25 – KPMG's risk preparedness framework



Climate-related risks and opportunities are now today's reality. Unless businesses take strategic action now, they will find themselves at a brand and cost disadvantage within the next ten years.

- *Six sectors are in the climate danger zone*

  Six major industry sectors are in particular danger from climate change risks. In addition to oil and gas and aviation, this zone included four sectors not widely perceived as vulnerable to climate change: healthcare, the financial sector, tourism and transport. Despite a high level of perceived risk, *KPMG* believes that, except for oil and gas, the risks of these sectors remain underestimated. While the oil and gas sector is far better prepared than any of the other sectors in the "danger zone", the climate change issues it faces make it the riskiest of all the 18 sectors. By contrast, transport is a far less risky sector but its level of preparedness is the worst of all the 18.

- *Three sectors in the climate safe haven*

  In addition, of the 18 sectors included in the report – even the three deemed to be in the "safe area" are not sufficiently prepared to deal with the new risks associated with climate change. Take a sector like food and beverages for example. This is supposedly a low-risk sector yet recent events have shown that this industry is highly vulnerable to climate related risks such as increases in agricultural input costs. The idea therefore that this sector is relatively safe from climate change effects is likely to reflect a significant under-estimation of risk.

Looking Ahead

- To meet these challenges companies must improve their understanding of how such risks affect their businesses, and they must adapt to and mitigate these risks. It is important that companies consider carbon management as a business risk instead of just another environmental issue. Most companies already have management systems in place to identify and manage business risks. These generally accepted approaches to enterprise risk management and business continuity provide a sound basis for managing climate-change risks.
- In this way, the challenge of anticipating the long-term direct and indirect implications of climate change will be one of organisational integration rather than the development of entirely new systems of risk management and control.
- Some organisations have already implemented carbon management initiatives, perhaps by measuring their carbon footprint and identifying the "low-hanging fruit" in terms of emissions reductions. However, an appropriate response requires more than this. Few organisations to date have adopted a structured approach to deliver lasting value. Many companies are not getting maximum value from their carbon management programmes, because they have not linked it to core business objectives.
- The demand for focused and effective reporting on the business implications of climate change from investors and other stakeholders has continued to grow over the last two years. The CDP is evidence of this increasing trend as is the increasing expectation that corporate sustainability reports include information about the business implications of climate change, reflected by the inclusion of a new indicator (EC2) in the GRI G3 Sustainability Reporting Guidelines, namely "Financial implications and other risks and opportunities for organisation's activities due to climate change."

The challenge for business is to develop an integrated, long-term carbon management strategy, using existing risk management processes and linked to core business objectives. Companies that understand the new climate reality – and that are willing to invest in preparedness and risk management – are also best equipped to seize the opportunities.

Responsible Investment and the Carbon Disclosure Project

Commentary by Frater Asset Management (Project Sponsor of CDP South Africa)

The CDP was established to facilitate dialogue between companies and investors to ensure that capital is appropriately taking into account risks and opportunities relating to climate change. More than 385 institutional investors with assets under management of US$57 trillion have issued the CDP questionnaire to the world's large corporations. The collective assets under management by the signatories have increased by more than 30% over the last year demonstrating that an increasing number of investors are considering climate change in their investment decisions.[58]

In spite of the increasing global awareness, it is of great concern that the South African signatories only include two banks, one insurance company and two asset managers including *Frater Asset Management (FAM)*. The investment and financial sectors are vital to leveraging an appropriate response to climate change given their ability to specify the terms on which capital is made available.

In May 2006, *FAM* was the first asset manager in South Africa to sign the UN Principles for Responsible Investment (UN PRI) (This followed the release of its own Fraters' Principles in November 2004). The UN PRI requires investors to incorporate environmental, social and governance (ESG) issues into their investment analysis and decision-making. *FAM* is a long-term investor and it integrates responsible investment activities into the investment process to add investment value and limit downside risk. This includes the incorporation of ESG issues. The ESG performance of companies is an indicator of the quality of management and the company's ability to respond to long-term trends and maintain a competitive advantage.

Goldman Sachs' research has discovered a strong link between management's ability to address ESG issues and its ability to steer the company towards sustained growth, profitability and, accordingly, enhanced stock valuation.[59] ESG issues can therefore materially affect the valuation of a company.[60] Sound ESG information helps achieve better valuations that are critical for sound investment decisions and ultimately superior investment returns. In addition, it recognises that applying the principles may better align investors with the broader objectives of society.

The link between ESG information and better valuations of companies has led to its commitment to two important initiatives to improve the ESG information available to its analysts:

1. Working with Calvert and the Government Employees Pension Fund (GEPF) to improve company disclosure in South Africa[61]
2. A signatory investor and sponsor to the CDP6 (2008)

The CDP will encourage companies to improve their disclosure. This will provide investors with better information that will lead to better valuations of companies. Companies that take action to identify and manage climate change risks will help to reduce GHG emissions, avoid investing in assets, products and processes with limited lifetimes in a carbon-constrained future, and position themselves to generate new revenue, reduce costs, increase margins, build their brand and attract and retain skilled people. These results will ensure increasing shareholder value.

Many companies are increasing their energy efficiency and reducing GHG emissions and costs at the same time. A well-known example is *General Electric (GE),* which responded to a resolution put forward at its AGM requiring the board to consider what action it could take to promote energy efficiency and combat climate change. *GE* responded by carrying out detailed studies that demonstrated that change could reduce GHG emissions, enhance its market reputation and add material revenue. This was the start of the *GE* "ecomagination" project.

Ford is the first United States automobile company to release publicly its plans to meet earlier published goals of reducing its GHG emissions by at least 30% from its new vehicle fleet of light duty passenger cars and trucks by 2020. Investors concerned with climate change and a carbon-constrained economy presented

The CDP disclosure will help FAM identify how JSE companies are dealing with the risks and opportunities. This helps FAM understand how companies are positioning themselves to maintain competitive advantage in a future carbon-constrained world.

58 Carbon Disclosure Project Press Release (4 February 2008).

59 Demystifying Responsible Investment Performance – A review of key academic and broker research.

Climate change is a uniquely serious risk as it challenges the future of our planet. If the scientific consensus is correct, climate change could be the greatest single risk to the sustainability of all businesses and has to be overcome in this century.

climate-related shareholder resolutions to *Ford* which were withdrawn after *Ford* announced it would release its GHG reduction plans. This announcement is important because it is the first time a US carmaker has laid out how it plans to achieve its CO_2 reduction goals. The information will be released in *Ford's* Sustainability Report.[62] "Long-term investors need to know that there is a plan in place for our company to be profitable in a carbon constrained economy."[63]

Fifteen Rockefeller family members filed or co-filed shareholder resolutions urging *ExxonMobil* to address a rapidly changing energy industry more effectively. Although the shareholder resolutions were defeated, they have helped raise management and public awareness around the issues.

"The next generation of global companies has an opportunity and a responsibility that past generations have not had, to play a central role in protecting life on the planet from the devastation of climate change. Their response to this challenge will be critical in shaping the wider role of tomorrow's global company in society."[64]

Investing in Climate Change Brings Real Long-Term Rewards

Commentary by Nedbank (Project Sponsor of CDP South Africa)

The issues surrounding climate change have undoubtedly gained more focus in South Africa over the past few years, thanks mainly to the heightened levels of media attention and the resultant growing awareness of the potential impact that global warming is certain to have on South Africa, particularly in terms of its biodiversity, energy and water resources. However, climate mitigation and adaptation strategies, and the measurement of costs – both current and future – relating to these strategies, do not appear to have risen to the level of importance that they should have on the majority of corporate agendas.

The *Nedbank Group* recognises that this widespread delay by corporate South Africa in taking significant action to limit its impact on the environment is largely the result of a general lack of recognition of the urgent requirement to do so. However, it is also of the belief that there is insufficient insight by many corporates into the many opportunities inherent in an effective carbon emissions policy. The potential rewards of these investments, while not only of a financial nature, are of immense significance to any organisation that is serious about the long-term sustainability of its operations.

It is *Nedbank's* belief that banks, in particular, have a vital role to play in encouraging and enabling the transition that is required from a carbon-intensive economy to the broad adoption of more efficient, low-carbon alternatives. This represents an opportunity for financial institutions to take a leadership role in addressing climate change, by promoting an understanding within the industry that the phenomenon is affecting the country's financial sector, both directly through banking operations and indirectly through the business investments, those banks are making.

In line with its vision to be southern Africa's most highly regarded and respected bank, as well as its "Deep Green" aspiration to be highly involved in the environment, the *Nedbank Group* is committed to taking on this leadership role in the area of climate resilience within the South African financial services industry. This commitment has seen the group engaging extensively with national government, inter-governmental organisations and civil society to promote and develop policies and measures that will provide an enabling framework for the SA business sector to contribute effectively towards building a low-carbon economy.

It is also the reason why climate change is now an integral part of the *Nedbank Group's* strategic focus, underpinning its long-term business targets and sustainability initiatives. To this end, the group has contextualised its climate change response within its broader environmental management and corporate responsibility frameworks. This includes a number of environmental commitments, such as: investing in the CDP; being the only African bank to have adopted the Equator Principles; becoming a member of UNEP FI; and its ground-breaking, mutually beneficial conservation partnership with the *World Wide Fund for Nature South Africa (WWF-SA).*

60 ABI Research Paper 7 – Governance and Performance in Corporate Britain.

61 A collaborative PRI signatory engagement to improve emerging market disclosure.

62 SRI World Group – April 15, 2008.

63 Sister Patricia A. Daly, executive director, Tri-State Coalition for Responsible Investment, and representative for the Sisters of St. Dominic of Caldwell, the lead resolution filer.

As part of this strategic response to climate change, the *Nedbank Group* has also drafted a "Climate Change Position Statement", that is supported by intensity reduction targets that are being incorporated into its business planning processes and balanced scorecard measurements. The effective implementation of the bank's corporate responsibility framework, as well as efforts to address energy and climate change issues, form part of the balanced scorecard against which the ongoing performance of every *Nedbank Group* executive is measured.

And while the day-to-day business operations of the Nedbank Group have a far smaller environmental impact than those of companies in carbon emission intensive industries, it recognises that with almost 28,000 employees scattered across South Africa, its combined carbon footprint must be actively managed. This is achieved through an intensive group-wide carbon management programme, which includes ongoing energy efficiency measures, awareness raising amongst staff, and many other recognised forms of carbon reduction: from flexi-time workdays to limit the impact the organisation has on traffic congestion, to staff buses aimed at, among other things, lessening the number of single-occupant vehicles on the country's roads.

The fact that climate change also poses a potentially massive future risk to the investments made by the group places a significant burden of responsibility on the bank to work with its business partners and clients to mitigate these risks for the long-term benefit of all its stakeholders. As such, *Nedbank* is committed to developing innovative financing solutions to facilitate investment in energy efficiency projects and has established a carbon finance team, which is involved in the origination of CDM projects under the framework of the Kyoto Protocol. As part of its investment into sustainable business practices, the group also advises and works with clients and project developers in an attempt to minimise the overall carbon footprint of its project-financing portfolio. Currently, the viability of setting portfolio-wide carbon reduction targets is also being investigated.

As South Africa's recognised "Green Bank", *Nedbank* has formally included climate change as a key shaping force in the group's strategy programme, ensuring that the bank's environmental contribution extends far beyond mere regulatory compliance. Rather, *Nedbank's* vision to be a leading influence in combating climate change within the South African banking industry has seen it increasingly exerting a positive influence on its clients, suppliers, partners and stakeholders, while also playing a significant role in ensuring the preservation of the planet.

Ultimately, the *Nedbank Group* considers its many investments into a variety of initiatives aimed at addressing the climate change crisis as money very well spent. Apart from the immediate reputational benefits that such investments deliver in further entrenching its reputation as the nation's "green bank", enjoying the privilege of having been able to make a small contribution to the successful efforts to preserve the planet for future generations will ultimately also be its own reward.

Responding to the Business Opportunities of Climate Change

Commentary by Macquarie First South Securities (Project Sponsor of CDP South Africa)
Recognising the significant potential business opportunities that climate change presents, *Macquarie* has established two teams to identify investment and commercial opportunities arising from climate change for investors and clients: the *Macquarie Capital* Climate Change Team, and the Treasury and Commodities Environmental Financial Products Team (TCG EFP).

Macquarie Capital Climate Change Team
Macquarie Capital has established a dedicated Global Climate Change team to create and source investment opportunities presented by climate change, and to coordinate *Macquarie Capital's* energy and carbon activities, which encompass wind, solar energy, biofuels, carbon credits and other renewable assets. The team forms part of *Macquarie's* global network and its activities will

Climate mitigation and adaptation strategies, and the measurement of costs – both current and future – relating to these strategies, do not appear to have risen to the level of importance that they should have on the majority of corporate agendas.

There is insufficient insight by many corporates into the many opportunities inherent in an effective carbon emissions policy.

assist in better positioning *Macquarie* for future business within the renewable/green and carbon sectors.

The team has identified and is responding to the following specific business opportunities:

- Environmental markets and emissions trading
- Renewables including wind, biofuels, solar, geothermal, wave, gas and biomass
- Project finance, corporate advisory and mergers and acquisitions
- Investment and partnerships in renewable projects
- Structuring development funding for greenfield projects
- Environmental policy development
- The manufacture and distribution of climate change financial products

Macquarie manages in excess of A$1.3 billion in renewable energy assets. These include investments in:

- Various wind farms throughout Europe, including: 8 MW operating in Sweden, 9 MW operating in France, 21 MW under construction in France; and an option on 8.5 MW under construction in Poland
- Six wind facilities in North America including one of the largest wind farms in Ontario, Canada
- A strategic partnership in 950 MW of wind power and a 161 MW wind farm in Texas
- Two wind farms in Taiwan
- Landfill gas and biomass facilities in the UK and Canada
- A high-quality hydro asset and representing 36 MW of capacity
- Solar investment opportunities in U.S., Australia and the UK

Treasury and Commodities Environmental Financial Products Team

The Treasury and Commodities Group established the Environmental Financial Products Team in 2005, providing a wide range of products and services relating to managing environmental financial risks. The team offers the following products and/or participates in the following markets:

- Emission allowance trading in the European Union, Australia (in advance of the scheme projected start date of 2010) and soon to be extended to New Zealand, United States and Japan as their Emission Trading Schemes come on line, as well as emissions credit trading under the Kyoto Protocol flexibility mechanisms
- CER risk management products including futures, forwards, exchange traded options, swaps and over-the-counter structured derivatives
- Structuring and financing principal participation in emissions reduction projects through direct equity investment, debt, technology financings, equipment leasing and structured derivatives
- Structured solutions including emissions portfolio swaps/financings, emissions related capital raisings, emissions product credit enhancement, debt for CER swaps and investor products

The suite of services and activities undertaken by these two teams within *Macquarie*, demonstrate the nature and extent of the potential business opportunities associated with the global challenge of climate change.

64 Tomorrow's Global Company: Climate change – the role of global companies. www.tomorrowscompany.com.

7

Closing commentary: An NGO perspective

The World Wide Fund for Nature (WWF) South Africa provides some closing thoughts on the business implications of climate change.

Climate change, or more accurately, the failure to maintain the planetary carbon balance, has been described by Sir Nicholas Stern as the largest market failure in the history of humanity. Such a failure affects everyone and requires nothing short of a second industrial revolution: the “post-carbon revolution”.

Today, leading investors seek long-term value that provides for broader social and environmental matters beyond a narrow focus on profit at any cost.

Climate change is far from a peripheral issue for business. The advent of climate change and the scale of the disruption resulting from the burning of fossil fuels and deforestation marks an age of unprecedented risk. It is the most critical modern-day, global emergency and a matter of survival for millions of people and thousands of species.

The reason that companies exist is to produce products and services. However, given the current global energy and transport infrastructure, this productivity typically comes with the unwanted by-product of increasingly dangerous greenhouse gas emissions. In this context, the challenge – and opportunity – will be for the private sector to develop business models, strategies, products and services appropriate to a carbon-constrained economy.

Today, leading investors seek long-term value that provides for broader social and environmental matters beyond a narrow focus on profit at any cost. Climate change represents a wide-ranging risk to humanity and the biosphere on which it is wholly dependent, and is thus increasingly an issue that is top-of-mind for responsible investors. With carbon dioxide from fossil fuels responsible for approximately half of the human impact of climate change on the planet,[65] the results of the CDP, considered alongside a company's financial and social performance reports, highlights valuable risks and opportunities for investors in the 21st century. Taken together, financial and socio-environmental reporting provides indicators on the sustainability of a company.

Sustainability is defined in the South African constitution as a consideration of social and environmental matters along with economic and financial concerns. People should strive for the sustainability space of the common ground between these important spheres. The pursuit of profit and the promotion of environmental good are not exclusive and indeed are increasingly acknowledged as being complementary, not competitive.

Valuation techniques around abstract forms of value – such as brand, trust, social impact or intellectual property – can be considered alongside wages, tax contributions, R&D, and training to value a company's social value creation in financial terms. On the environmental bottom-line, carbon is in a unique position to be expressed in financial terms as value that a company creates or destroys, since carbon is traded and priced in an increasingly international and regulated market.

An important role player in South Africa, which laudably reports voluntarily to the CDP, is *Eskom*, whose investor is the South African government and therefore, taxpayers (which includes all of the CDP reporters). Eskom is a critical player in the South African climate change equation, as this CDP report demonstrates, for most companies their carbon exposure derives primarily from either electricity bought from *Eskom*, or fuel used for transport. At the same time, fast-emerging electric vehicle alternatives to costly oil-combusting engines may see electricity increasingly replace transport fuel. Unless electricity is de-carbonised by a switch to renewable technologies, electricity will remain a large and growing contributor to SA’s greenhouse gas emissions.

With its CO_2 emissions totalling over 220 Mt, *Eskom* is the largest single emitter to report to the CDP globally, the largest emitting utility, a Russian company, does not report to the CDP. A carbon price of 20 Euro (or R200/t CO_2) would put a dent of R44 billion in its financial bottom-line – more than its 2007 revenue of R40 billion. The effect of carbon on economic value is very real, since carbon taxes or selling savings of that magnitude on the market would subtract from or add to the bottom-line. *Sasol*, the next biggest emitter in South Africa, produces roughly 70 Mt of CO_2, which would be valued at R14 billion per year at those prices.

In 2006, the World Bank put South Africa’s net economic savings at 2.6% of GDP. In generating that 2.6%, it has been estimated that the country destroyed 2.3% worth of natural capital (extraction and pollution costs at market prices). If it were not for 5.3% of GDP spent on education, building up the social capital, South Africa would have had

near-zero net wealth creation on a national triple bottom line or "real wealth creation."

Before 1994, South Africa did not have the same level of social investment and this resulted in a negative national triple-bottom-line or "adjusted net savings". A price of carbon higher than the € 20/t CO_2 used in this calculation would reduce South Africa's real wealth even further.

Triple-bottom-line valuation applies not only to national economies, but also to economic sub-units such as industries, companies and projects. A Coega smelter will use 3% of the country's energy demand, but create only 800 jobs. Solar water heaters can save as much electricity and create ten times as many jobs. Both of these can be profitable, but one investment clearly outperforms the other if all bottom-lines are considered.

The triple-bottom-line approach is ingrained as a human right in the South African constitution. It is currently being expanded into strategy, policy and regulation starting with the government's National Framework on Sustainable Development. In fact, the framework makes it clear that there can be no trade-offs between economic, social and environmental spheres: a healthy economy can only exist within a healthy society, just as a healthy society cannot exist outside a healthy environment. It also stresses that these considerations are underpinned by good governance, of which transparency is a key part.

For the sake of the planet and its people, as well as for companies, people need to appreciate and address the "three Fs" that now threaten global security and stability: fuel, food and finance. This will only be done through valuing life – of which carbon is a critical part.

The CDP and those forward-thinking companies that show leadership by responding to its questionnaire are a measure of how companies, are facing up to the challenge of their lifetime. Over time, this kind of disclosure will help lead companies, and the economies of which they form a part, towards a sustainable future.

It is a common observation that the multinationals and resource-intensive companies that dominate the JSE Top 40 have understandably had the biggest historic exposure to carbon issues as a business risk and are most aware of its implications. This probably accounts for the drop of responses in the larger sample (as a percentage rather than in absolute terms), but also suggests that the focus is still skewed to carbon risk rather than carbon opportunity, which is spread more evenly across all sectors.

Carbon risk is highly clustered around fossil fuel and precious metal companies. Though these companies are some of the largest by capitalisation (also being the most consolidated), mining only accounts for 5% of the country's GDP. On the other hand, it is noteworthy that a large portion of financial value is generated by low-carbon companies that disclosed emissions contributing only 2% of the total reported.

As a whole, SA companies are still overly fixated on emissions accounting – a practice that is essential, but not spilling over into strategy and management. The progressive realisation that a carbon price applied in some form or another will render carbon risk material, will increasingly drive response beyond (though based on) disclosure, as investors and managers translate emissions into rands.

Responding to carbon risk and opportunity requires a vision of the future in 3D: carbon exposure and a strategic response to minimising it should be Declared, Decided and Delivered. These are not three sequential steps as much as elements of a continuous cycle. None is an excuse for not doing the other and each helps to refine the others.

Partnerships are a further pre-requisite: restoring the public good of a balanced carbon cycle will require civic and multilateral cooperation. Companies have to reach beyond their traditional business partners, to government and civil society and participate in the meeting of nations to set a clear and common course to a post-carbon future.

The CDP and those forward-thinking companies that show leadership by responding to its questionnaire are a measure of how companies are facing up to the challenge of their lifetime. Over time, this kind of disclosure will help lead companies, and the economies of which they form a part, towards a sustainable future.

65 According to the WWF's 2006 Living Planet Report.

Appendix 1 – CDP6 (2008) Questionnaire

The CDP questionnaire has been developed over six years through consultation with signatory investors, corporations and other stakeholders. The CDP6 questionnaire represents a best practice framework for the information companies should measure and report regarding the impact of climate change on their business.

Methodology overview

The CDP6 questionnaire and guidance

CDP has used a similar questionnaire for CDP6 to those used in prior years, building on the experience of data collection and reporting in many of the companies covered by the process.

To encourage clarity in responses, the questionnaire was split into four sections covering risks and opportunities; emissions accounting; performance against targets; and governance. The main additional questions in CDP6 (compared to CDP5) are in the areas of data accuracy and stakeholder/policy-maker engagement. Respondents were also provided with a detailed set of guidance notes highlighting the content that an ideal response to each question might include.

The questionnaire is included in this section, while the guidance notes are available on the CDP website at www.cdproject.net

Overview of scoring and weighting system

The Climate Disclosure Leadership Index has again been produced based on the weighted scoring of companies' responses to the individual questions in the questionnaire. The methodology and weightings were developed jointly between CDP and PricewaterhouseCoopers LLP.

A number of important refinements were made to the scoring system used in CDP6, compared to the approach used in previous years' reports, in particular in relation to the greater disclosure by companies outside of traditionally carbonintensive sectors.

In the questionnaire for CDP5, companies in non-carbon-intensive sectors were invited to answer only a subset of the questions posed to companies in carbon-intensive sectors, and their CDLI scores were based only on these questions. For CDP6, all companies were encouraged to provide at least a minimum level of response to every question; companies in carbon-intensive sectors were asked to answer all questions, whereas non-intensive companies were asked to answer 'minimum requirement' questions and also invited to answer 'comprehensive' questions if they so chose.

Hence, carbon-intensive sectors have been scored on the basis of all questions (with a total theoretical maximum of 146 points, which is then adjusted to a score out of 100%), while non-carbon-intensive sectors are scored on the basis of only the minimum requirement (a maximum of 85 points adjusted to a score out of 100%), with extra credit given for 'comprehensive' answers. A company in a non-carbon-intensive sector that gives a high-scoring comprehensive answer can theoretically achieve more than 85 points for its answer in which case this is adjusted down to the maximum for the relevant section. CDP believes that this approach is more consistent with the importance that is now placed on climate change across all sectors.

The impact of this change is that companies in non-carbon-intensive sectors have tended to achieve higher overall weighted scores, despite achieving slightly lower unweighted scores. It should be remembered, therefore, that comparisons within different sectors (intensive/non-intensive) are perhaps more meaningful than comparisons across sectors.

Data quality and accuracy

All data presented and reviewed in this report is self-reported by the CDP6 respondent companies and has not been verified by either CDP or PricewaterhouseCoopers for the purposes of this report (although some companies have provided verification statements commissioned for their own purposes). Where responses included material that appeared incorrect or confusing, attempts were made to clarify these directly with CD6 respondent companies, but no formal due diligence or any other form of assurance has been undertaken by either CDP or Pricewaterhouse-Coopers on the responses or underlying data.

How response quality is assessed

The scoring system is based on quantitative and qualitative assessment of responses. In broad terms this takes into account whether a question has been answered at all and an analysis of the extent and quality of the response. Inevitably, there is an inherent element of subjectivity in the scoring. We have sought to mitigate this through the provision of detailed guidance on the scoring process and through independent reviews and benchmarking of the scoring process.

The scoring system focuses on disclosure, not climate change performance per se. In general, a good score can be achieved by following the guidance issued by CDP and by providing comprehensive responses to individual questions. Particularly good responses are typically both specific and detailed.

For example, below is a response that would attract full points under Question 1(a)(i) "How is your company exposed to regulatory risks related to climate change?"

"The majority of our power plants are subject to the EU ETS. The present NAP II proposals cause an additional financial burden for (company) in the form of insufficient allocation equivalent to 30-40% of needed emission rights.

The European Commission adopted a new set of climate-protection measures for the period from 2013 to 2020. They include binding goals for all EU member states regarding the reduction of greenhouse gas emissions and the share of electricity consumption accounted for by renewable energy. But the details of an international or European emissions trading system remain largely unclear. However, we anticipate that costs will be much higher than in the current trading period, which will last until 2012. We intend to continue reducing CO_2 emissions and make our power generation portfolio more flexible by investing in power plants in the future. Furthermore, we limit CO_2 risks through climate-protection projects in developing and newly industrialising countries within the scope of the Kyoto "Clean

Development Mechanism" (CDM) and "Joint Implementation" (JI).

Presently we see no significant pressure arising from national or international targets on demand management. Our investment decisions already include the influence of energy efficiency programs. We believe that gas consumption will be much more affected than electricity consumption.

Compared to CDP 5 our views have not changed significantly especially as the uncertainty concerning the period beyond 2012 still prevails."

Where responses score poorly, this is generally because of one or all of the following:

- A response does not fully answer the question asked
- A response is insufficiently specific to the respondent (i.e. it could apply to any company)
- A response does not provide relevant data or specific information to support the statements being made

Defining emissions
The classification of emissions used by CDP in the context of questions about emissions measurement, management and reporting follows the classification adopted by the GHG Protocol. For ease of reference we reproduce a summary of these definitions below.

Scope 1: Direct GHG emissions
Companies report GHG emissions from sources they own or control as Scope 1. Direct GHG emissions are principally the result of the following types of activities undertaken by the company. Examples include (i) the generation of electricity, heat, or steam from stationary sources; (ii) physical or chemical processing; (iii) emissions from the combustion of fuels in company owned/controlled mobile combustion sources; and (iv) emissions that result from intentional or unintentional releases during business operations.

Scope 2: Electricity indirect GHG emissions
Companies report the emissions from the generation of purchased electricity that is consumed in owned or controlled equipment or operations as Scope 2. For many companies, purchased electricity represents the largest component of GHG emissions if they do not have their own on-site power generation capability.

Scope 3: Other indirect GHG emissions
In broad terms, Scope 3 emissions could include (i) supply chain emissions from the extraction, production and transport of raw materials and fuels; (ii) employee business travel; (iii) employee commuting; (iv) transport of finished goods and waste products; and (v) emissions associated with product use and disposal. The definition of Scope 3 emissions is more open to interpretation but provides an opportunity for companies to be innovative in GHG management.

Note on difference in samples between response rates and analysis

Several companies responded to CDP after the deadline for information to be included in the analysis.

These responses were still considered in the response rate analysis in Chapter 3, and all response rate data listed in sector Key Facts boxes is based on this analysis. However, the analysis of CDLI scores, disclosure levels and responses to specific questions, including the disclosure waterfalls, does not include these late responding companies. We do not believe this has made a material difference to sector performance.

CDP 6 Questionnaire

1 Risks and Opportunities

Objective: To identify strategic risks and opportunities and their implications.

a **Risks:** (CDP5 Question 1a)

- i **Regulatory Risks:** How is your company exposed to regulatory risks related to climate change?
- ii **Physical Risks:** How is your company exposed to physical risks from climate change?
- iii **General Risks:** How is your company exposed to general risks as a result of climate change?
- iv **Risk Management:** Has your company taken or planned action to manage the general and regulatory risks and/or adapt to the physical risks you have identified?
- v **Financial and Business Implications:** How do you assess the current and/or future financial effects of the risks you have identified and how those risks might affect your business?

b **Opportunities:** (CDP5 Question 1b)

- i **Regulatory Opportunities:** How do current or anticipated regulatory requirements on climate change offer opportunities for your company?
- ii **Physical Opportunities:** How do current or anticipated physical changes resulting from climate change present opportunities for your company?
- iii **General Opportunities:** How does climate change present general opportunities for your company?
- iv **Maximising Opportunities:** Do you invest in, or have plans to invest in products and services that are designed
  to minimise or adapt to the effects of climate change?
- v **Financial and Business Implications:** How do you assess the current and/or future financial effects of the opportunities you have identified and how those opportunities might affect your business?

2 Greenhouse Gas (GHG) Emissions Accounting

Objective: To determine actual absolute Greenhouse Gas emissions.

The term GHG Protocol below refers to The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). This may be found on the GHG Protocol website, www.ghgprotocol.org.

a **Accounting Parameters** (CDP5 Question 2a)

- i **Reporting Boundary:** Please indicate the category that best describes the company, entities or group for which your response is prepared:
  a. Companies over which financial control is exercised – per consolidated audited Financial Statements.
  b. Companies over which operational control is exercised.
  c. Companies in which an equity share is held.
  d. Other (please provide details).
  Please use the same approach for all answers.
- ii **Reporting Year:** Please explicitly state the dates of the accounting year or period for which GHG emissions are reported.
- iii **Methodology:** Please specify the methodology used by your company to calculate GHG emissions.

b Direct and Indirect Emissions – Scope 1 and 2 of the GHG Protocol (CDP5 Question 2b)

i Are you able to provide a breakdown of your direct and indirect emissions under Scopes 1 and 2 of the GHG Protocol and to analyse your electricity consumption? If so, please provide the following information together with a breakdown of the emissions reported under each category by country where possible. If not, please proceed to question 2b ii:

Scope 1 Direct GHG Emissions

a. Total global Scope 1 activity in metric tonnes CO_2e emitted.
b. Total Scope 1 activity in metric tonnes CO_2e emitted for Annex B countries.

Scope 2 Indirect GHG Emissions

c. Total global Scope 2 activity in metric tonnes CO_2e emitted.
d. Total Scope 2 activity in metric tonnes CO_2e emitted for Annex B countries.

Electricity consumption

e. Total global MWh of purchased electricity.
f. Total MWh of purchased electricity for Annex B countries.
g. Total global MWh of purchased electricity from renewable sources.
h. Total MWh of purchased electricity from renewable sources for Annex B countries.

ii If you are unable to detail your Scope 1 and Scope 2 GHG emissions and/or electricity consumption, please report the GHG emissions you are able to identify together with a description of those emissions.

c Other Emissions – Scope 3 of GHG Protocol: (CDP5 Question 2c)

How do you identify and/or measure Scope 3 emissions? Please provide where possible:

a. Details of the most significant Scope 3 sources for your company.
b. Details in metric tonnes CO_2e of GHG emissions in the following categories:
   i Employee business travel.
   ii External distribution/logistics.
   iii Use/disposal of company's products and services.
   iv Company supply chain.
c. Details of the methodology you use to quantify or estimate Scope 3 emissions.

d External Verification (CDP5 Question 2a iii)

i Has the information reported in response to Questions 2b – c been externally verified or audited or do you plan to have the information verified or audited? If so:

ii Please provide a copy of the audit or verification statement or state your plans for verification.

iii Please specify the Standard or Protocol against which the information has been or will be audited or verified.

e Data Accuracy (New to CDP6)

Does your company have a system in place to assess the accuracy of GHG emissions inventory calculation methods, data processes and other systems relating to GHG measurement? If so, please provide details. If not, please explain how data accuracy is managed.

f Emissions History (CDP5 Question 2a iv)

Do the emissions reported for your last accounting year vary significantly compared to previous years? If so, please explain the reasons for the variations.

g Emissions Trading (CDP5 Question 4b)

i Does your company have facilities covered by the EU Emissions Trading Scheme? If so:
   a. Please provide details of the annual allowances awarded to your company in Phase I for each of the years from 1 January 2005 to 31 December 2007 and details of allowances allocated for Phase II commencing on 1 January 2008.
   b. Please provide details of actual annual emissions from facilities covered by the EU ETS with effect from 1 January 2005.
   c. What has been the impact on your company's profitability of the EU ETS?

ii What is your company's strategy for trading or participating in regional and/or international trading schemes (eg: EU ETS, RGGI, CCX) and Kyoto mechanisms such as CDM and JI projects?

h Energy Costs (CDP5 Question 4d)

i Please identify the total costs in US$ of your energy consumption e.g., from fossil fuels and electric power.

ii What percentage of your total operating costs does this represent?

iii What percentage of energy costs are incurred on energy from renewable sources?

3 Performance

Objective: To determine performance against targets and plans to reduce GHG emissions.

a **Reduction Plans** (CDP5 Questions 1d and 4a)

i Does your company have a GHG emissions reduction plan in place? If so, please provide details along with the information requested below. If there is currently no plan in place, please explain why.

ii What is the baseline year for the emissions reduction plan?

iii What are the emissions reduction targets and over what period do those targets extend?

iv What activities are you undertaking to reduce your emissions eg: renewable energy, energy efficiency, process modifications, offsets, sequestration etc? What targets have you set for each and over what timescales do they extend?

v What investment has been or will be required to achieve the targets and over what time period?

vi What emissions reductions and associated costs or savings have been achieved to date as a result of the plan?

b **Emissions Intensity** (CDP 5 Question 4c)

i What is the most appropriate measurement of emissions intensity for your company?

ii Please state your GHG emissions intensity in terms of total tonnes of CO_2e reported under Scope 1 and Scope 2 per US $m turnover and EBITDA for the reporting year.

iii Has your company developed emissions intensity targets? If so:

a. Please state your emissions intensity targets.

b. Please state what reductions in emissions intensity have been achieved against targets and over what time period.

If not, please explain why.

c **Planning** (CDP5 Question 4e)

Do you forecast your company's future emissions and/or energy use? If so:

i Please provide details of those forecasts, summarise the methodology used and the assumptions made.

ii How do you factor the cost of future emissions into capital expenditure planning?

iii How have these considerations made an impact on your investment decisions?

4 Governance

Objective: To determine responsibility and management approach to climate change.

a **Responsibility** (CDP5 Question 5a)

Does a Board Committee or other executive body have overall responsibility for climate change? If not, please state how overall responsibility for climate change is managed. If so:

i Which Board Committee or executive body has overall responsibility for climate change?

ii What is the mechanism by which the Board or other executive body reviews the company's progress and status regarding climate change?

b **Individual Performance** (CDP5 Question 5b)

Do you assess or provide incentive mechanisms for individual management of climate change issues including attainment of GHG targets? If so, please provide details.

c **Communications** (New to CDP6)

Please indicate whether you publish information about the risks and opportunities presented to your company by climate change, details of your GHG emissions and plans to reduce emissions through any of the following communications:

i the company's Annual Report or other statutory filings, and/or

ii formal communications with shareholders or external parties, and/or

iii voluntary communications such as Corporate Social Responsibility reporting.

If so, please provide details and a link to the document(s) or a copy of the relevant excerpt.

d **Public Policy** (New to CDP6)

Do you engage with policy-makers on possible responses to climate change including taxation, regulation and carbon trading? If so, please provide details.

Appendix 2

CDLI Scoring Methodology

CDLI scoring methodology

1 Risks and Opportunities

Question Number	Question	Response type	Max Points	Guidance
1(a)(i) Regulatory Risks	How is your company exposed to regulatory risks related to climate change?	Variable	3	[score under the standard scale for variable responses]
1(a)(ii) Physical Risks	How is your company exposed to physical risks from climate change?	Variable	3	[score under standard scale. Responses should be tailored and specific to the respondent's business. No points awarded if mentioned elsewhere and not here]
1(a)(iii) General Risks	How is your company exposed to general risks as a result of climate change?	Variable	3	[score under standard scale. No points for regulatory or physical risks. Must be others e.g. reputation, third party action, civil unrest, expensive inputs]
1(a)(iv) Risk Management	Has your company taken or planned action to manage the general and regulatory risks and/or adapt to the physical risks you have identified?	Variable	3	[score under standard scale – same points available whether answer is yes or no]
1(a)(v) Financial and Business implications	How do you assess the current and/or future financial effects of the risks you have identified and how those risks might affect your business?	Variable	3	[score under standard scale – same points awarded whether answer is yes or no]
1(b)(i) Regulatory Opportunities	How do current or anticipated regulatory requirements on climate change offer opportunities for your company?	Variable	3	[score under standard scale – no points for reductions/mitigations, only for actual opportunities]
1(b)(ii) Physical Opportunities	How do current or anticipated physical changes resulting from climate change present opportunities for your company?	Variable	3	[score under standard scale – no points for reductions/mitigations, only for actual opportunities]
1(b)(iii) General Opportunities	How does climate change present general opportunities for your company?	Variable	3	[score under standard scale – no points for regulatory or physcial risks; no points for reductions/ mitigations, only for actual opportunities]
1(b)(iv) Maximising Opportunities	Do you invest in, or have plans to invest in products and services that are designed to minimise or adapt to the effects of climate change?	Variable	3	[score under standard scale – same points awarded whether answer is yes or not, but need specific commercial upside plans in place to score high points. Investment in either external products or in external mitigation is OK]
1(b)(v) Financial and Business Implications	How do you assess the current and/or future financial effects of the opportunities you have identified and how those opportunities might affect your business?	Variable	3	[score under standard scale – same points awarded whether answer is yes or no]
		Total points available	**30**	

2 Greenhouse Gas (GHG) Emissions Accounting

Question Number	Question	Response type	Max Points	Guidance
2(a)(i) Reporting Boundary	Please indicate the category that best describes the company, entities or group for which your response is prepared.	Binary	1	[1 for any answer, 0 for none]
2(a)(ii) Reporting Year	Please explicitly state the dates of the accounting year or period for which GHG emissions are reported.	Binary	1	[1 for any answer, 0 for none]
2(a)(iii) Methodology	Please specify the methodology used by your company to calculate GHG emissions.	Variable	3	[score under standard scale]
2(b)(i) Scope 1 and Scope 2 of GHG Protocol	a. Total global Scope 1 activity in metric tonnes CO_2e emitted.	Binary	2	[2 for CO_2e or material "other", 0 for none/irrelevant other]
	b. Total Scope 1 activity in metric tonnes CO_2e emitted for Annex B countries.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other. 1 point if response is "0" and the company does not operate in Annex B countries]
	By country – Scope 1 activity in metric tonnes of CO_2e by individual country.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	c. Total global Scope 2 activity in metric tonnes CO_2e emitted.	Binary	2	[2 for CO_2e or material "other", 0 for none/irrelevant other]
	d. Total Scope 2 activity in metric tonnes CO_2e emitted for Annex B countries.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other. 1 point if response is "0" and the company does not operate in Annex B countries]
	By country – Scope 2 activity in metric tonnes of CO_2e by individual country.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	e. Total global MWh of purchased electricity CO_2e emitted.	Binary	1	[1 for MWh, 0 for none/irrelevant other]
	f. Total MWh of purchased electricity for Annex B countries.	Binary	1	[1 for MWh, 0 for none/irrelevant other. 1 point if response is "0" and the company does not operate in Annex B countries]
	By country – MWh of purchased electricity by individual country.	Binary	1	[1 for MWh, 0 for none/irrelevant other]
	g. Total global MWh of purchased electricity from renewable sources.	Binary	1	[1 for MWh, 0 for none/irrelevant other]
	h. Total MWh of purchased electricity from renewable sources for Annex B countries.	Binary	1	[1 for MWh, 0 for none/irrelevant other. 1 point if response is "0" and the company does not operate in Annex B countries]
2(b)(ii) – scope 1and scope 2 of GHG protocol	If you are unable to detail your Scope 1 and Scope 2 GHG emissions and/or electricity consumption, please report the GHG emissions you are able to identify together with a description of those emissions.	Variable	3	[score under standard scale – 0 for blank or N/A even if company has disclosed under 2bi]
2(c)(i) Other Emissions – Scope 3 of GHG Protocol	a) i How do you identify and/or measure Scope 3 emissions?	Variable	3	[standard scale – 1 for "we don't". Question is ambiguous, so if methodology is also provided here then score it under c below]
	a) ii Please provide details of the most significant Scope 3 sources for your company.	Binary	1	[1 for an answer, 0 for blank]
	b. Details in metric tonnes CO_2e of GHG emissions in the following categories: i Employee business travel.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	ii External distribution/logistics.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	iii Use/disposal of company's products and services.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	iv Company supply chain.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	c. Details of the methodology you use to quantify or estimate Scope 3 emissions.	Variable	3	[standard scale – but see a i above]
2(d) External Verification	(i) Has the information reported in response to Questions 2(b)-(c) been externally verified or audited or do you plan to have the information verified or audited?	Binary	1	[1 for an answer, 0 for blank]

Question Number	Question	Response type	Max Points	Guidance
	(ii) If your answer to question 2d(i) is Yes, please provide or attach a copy of the audit or verification statement or state your plans for verification.	Binary	1	[1 for an answer, 0 for blank]
	(iii) Please specify the standard or protocol against which the information has been audited or verified.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
2(e) Data Accuracy	Does your company have a system in place to assess the accuracy of GHG emissions inventory calculation methods, data processes and other systems relating to GHG measurement? If so, please provide details. If not, please explain how data accuracy is managed.	Variable	3	[score under standard scale – no points lost for answering "no" and can still get 3 pts if well justified]
2(f) Emissions History	Do the emissions reported for your last accounting year vary significantly compared to previous years? If so, please explain reasons for the variations.	Variable	2	[2 points "no", 1 point "yes" with no explanation, 2 points "yes" plus explanation
2(g) Emissions Trading	i) Does your company have facilities covered by the EU Emissions Trading Scheme? If so,	Binary	1	[1 for an answer, 0 for blank]
	a) Please provide details of the annual allowances (metric tonnes of CO_2) awarded to your company in Phase I for each of the years from 1 January 2005 to 31 December 2007 and details of allowances allocated for Phase II commencing on 1 January 2008.	Variable	2	[n/a if no ETS, 0 if no answer, 1 if some years, 2 if all years]
	b) Please provide details of actual annual emissions (metric tonnes of CO_2) from facilities covered by the EU ETS with effect from 1 January 2005.	Variable	2	[n/a if no ETS, 0 if no answer, 1 if some years, 2 if all years]
	c) What has been the impact on your company's profitability of the EU ETS?	Binary	1	[n/a if not ETS, 1 for an answer, 0 for blank]
	ii) What is your company's strategy for trading or participating in regional and/or international trading schemes (eg: EU ETS, RGGI, CCX) and Kyoto mechanisms such as CDM and JI projects? Explain your involvement for each of the following: EU ETS CDM/JI CCX RGGI Others ELECTRIC UTILITIES – not factored into CDP score but will be assessed in report sections.	Variable	3	[score under standard scale – treat answer for all projects as if one response]
2(h) Energy Costs	i) Please identify the total costs in US $ of your energy consumption eg from fossil fuels and electric power.	Binary	1	[1 for an answer, 0 for blank]
	ii) What percentage of your total operating costs does this represent?	Binary	1	[1 for an answer, 0 for blank]
	iii) What percentage of energy costs are incurred on energy from renewable sources?	Binary	1	[1 for an answer, 0 for blank]
		Total points available	**52**	

3 Performance

Question Number	Question	Response type	Max Points	Guidance
3(a) Reduction Plans	i) Does your company have a GHG emissions reduction plan in place? If so, please provide details along with the information requested below. If there is currently no plan in place, please explain why.	Variable	3	[standard scale – 1 point for just "yes" or "no"]
	ii) What is the baseline year for the emissions reduction plan?	Binary	1	[1 for an answer, 0 for blank]
	iii) What are the emissions reduction targets and over what period do those targets extend?	Binary (x2)	2	[1 for what are targets, 1 for what period]
	iv) What activities are you undertaking to reduce your emissions eg: renewable energy, energy efficiency, process modifications, offsets, sequestration etc? What targets have you set for each and over what timescales do they extend?	Variable	3	[standard scale]
	v) What investment has been or will be required to achieve the targets and over what time period?	Variable	2	[0 no or very limited response, 1 some thought, 2 projections]
doesn't	vi) What emissions reductions and associated costs or savings have been achieved to date as a result of the plan?	Variable	2	[0 no or very limited response, 1 some thought, 2 numbers – matter what the savings achieved actually are]

Question Number	Question	Response type	Max Points	Guidance
3(b) Emissions Intensity	i) What is the most appropriate measurement of emissions intensity for your company?	Binary	1	[1 for an answer, 0 for blank]
	Please give your company's emissions intensity figure for the measurement given above.	Binary	1	[1 for an answer, 0 for blank]
	ii) Please state your GHG emissions intensity in terms of total tonnes of CO_2e reported under Scope 1 and Scope 2 per US $m turnover and EBITDA for the reporting year. Scope 1/ US$ turnover	Binary	1	[1 for an answer, 0 for blank]
	Scope 2/ US$ turnover	Binary	1	[1 for an answer, 0 for blank]
	Scope 1/ EBITDA	Binary	1	[1 for an answer, 0 for blank]
	Scope 2/ EBITDA	Binary	1	[1 for an answer, 0 for blank]
	iii) Has your company developed emissions intensity targets; what are they; what reductions have you achieved?	Variable	3	[standard scale – combine answers to all 3biii questions. Receive 1 pt for "no" , but can receive up to 3 points with a "no" answer if it is well justified.]
3(c) Planning - Forecasted emissions/	Do you forecast your company's future emissions and/or electricity use?	Variable	3	[standard scale – 1 for just 'yes' or 'no', and up to 3 for an explained and reasonable "no"]
	i) Please provide details of those forecasts, summarise the methodology used and the assumptions made.	Variable	3	[standard scale]
	ii) How do you factor the cost of future emissions into capital expenditure planning?	Variable	3	[standard scale. Note that few answers appear comprehensive enough to justify 3 points]
	iii) How have these considerations made an impact on your investment decisions?	Variable	3	[standard scale]
	Please enter the accounting period used to report GHG emissions details below.	Binary	1	[1 for an answer, 0 for blank]
	Forecasted Scope 1 Direct GHG Emissions: Please provide: a. Forecasted Total global Scope 1 emissions in Metric tonnes CO_2e.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	b. Forecasted Total Scope 1 emissions in metric tonnes CO_2e for Annex B countries.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	By country – Forecasted Scope 1 emissions in metric tonnes of CO_2e by individual country.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	c. Forecasted total global Scope 2 emissions in metric tonnes CO_2e.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	d. Forecasted total Scope 2 emissions in metric tonnes CO_2e for Annex B countries.	Binary	1	[1 for CO_2e or material "other", 0 for none/irrelevant other]
	e. Forecasted total global MWh of purchased electricity.	Binary	1	[1 for MW or material "other", 0 for none/irrelevant other]
	f. Forecasted total MWh of purchased electricity for Annex B countries.	Binary	1	[1 for MW or material "other", 0 for none/irrelevant other]
	g. Forecasted total global MWh of purchased electricity from renewable sources by individual countries.	Binary	1	[1 for MW or material "other", 0 for none/irrelevant other]
	h. Forecasted total MWh of purchased electricity from renewable sources for Annex B countries.	Binary	1	[1 for MW or material "other", 0 for none/irrelevant other]
	i. Forecasted total global MWh of purchased electricity from renewable sources by individual countries. ELECTRIC UTILITIES – not factored into CDP score but will be assessed in report sections.	Binary	1	[1 for MW or material "other", 0 for none/irrelevant other]
		Total points available	**45**	

4 Governance

Question Number	Question	Response type	Max Points	Guidance
4(a) Responsibility	Does a Board Committee or other executive body have overall responsibility for climate change? If not, please state how overall responsibility for climate change is managed. If so, please answer parts (i) and (ii) below.	Variable	3	[standard scale – 1 point for just “yes” or “no”]
	i) Which Board Committee or executive body has overall responsibility for climate change?	Binary	1	[1 for an answer, 0 for blank]
	ii) What is the mechanism by which the Board or other executive body reviews the company’s progress and status regarding climate change?	Variable	3	[standard scale]
4(b) Individual Performance	Do you assess or provide incentive mechanisms for individual management of climate change issues including attainment of GHG targets? If so, please provide details.	Variable	3	[standard scale – 1 point for just “yes” or “no”]
4(c) Communications	Please indicate whether you publish information about the risks and opportunities presented to your company by climate change, details of your GHG emissions and plans to reduce emissions through any of the following communications: i) the company’s annual report or other statutory filings.	Variable	2	[0 for blank, 1 for a “no” answer or a “yes” with no additional commentary, and 2 points for a “yes” with commentary]
	ii) formal communications with shareholders or external parties.	Variable	2	[0 for blank, 1 for a “no” answer or a “yes” with no additional commentary, and 2 points for a “yes” with commentary. Note this MUST NOT be the CSR report]
	iii) voluntary communications such as corporate social responsibility reporting.	Variable	2	[0 for blank, 1 for a “no” answer or a “yes” with no additional commentary, and 2 points for a “yes” with commentary]
4(d) Public Policy	Do you engage with policy-makers on possible. responses to climate change including taxation, regulation and carbon trading? If so, please provide details.	Variable	3	[standard scale – doesn‘t matter whether the company does this directly or through trade associations as long as disclosed]
		Total points available	**19**	
		Total points in survey	**146**	

Methodology weighting

	Points (comprehensive)	Points (comp but not EU ETS)	Points (min standards)	Points (weighted)
Section 1	30	30	30	30
Section 2	52	47	33	35
Section 3	45	45	15	25
Section 4	19	19	7	10
Total	146	141	85	100

Companies in carbon-intensive sectors and participating in EU ETS are assessed out of 146 using the comprehensive scale.

Companies in carbon-intensive sectors that do not participate in EU ETS are assessed out of 141 using the comprehensive scale minus EU ETS questions.

Companies in non-carbon-intensive sectors are assessed out of 85 using the minimum standards scale.

Scores are normalised to be out of 100 (max score 100).

Glossary of Key Terms

ANC	African National Congress
BRIC	Brazil, Russia, India and China
C&BP	Construction and Building Products
CDLI	Carbon Disclosure Leadership Index
CDM	Clean Development Mechanism
CDP	Carbon Disclosure Project
CEO	Chief executive officer
CER	Certified emission reductions
CMP	Dimension Data's Carbon Management Plan
CO_2e	Carbon dioxide (CO_2) equivalent
CSI	Corporate social investment
DEAT	Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
DNA	Designated National Authority
DSM	Demand-side management
EBITDA	Earnings before interest, taxes, depreciation and amortisation
EC	European Community
EEA	Energy Efficiency Accord
E&P	Energy and Power
ERU	Emission reduction unit
ESG	Environmental, social and governance
EU ETS	European Union Emissions Trading Scheme
FAM	Frater Asset Management
FTSE	Financial Times and Stock Exchange
GE	General Electric
GHG	Greenhouse gas
GWh	Gigawatt hours
IETA	International Emissions Trading Association
IOC	International Oil Companies
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent power producer
ISO	International Organisation for Standardisation
JI	Joint implementation – Kyoto Protocol carbon reduction facility
JSE	Johannesburg Securities Exchange
LEED	Leadership in Energy and Environmental Design – US construction standards
LTMS	Long Term Mitigation Scenarios
M&A	Mergers and Acquisitions
NBI	National Business Initiative
NCCC	National Committee on Climate Change
NGOs	Non-Government Organisations
NOC	National Oil Companies
OFP	Organic Freedom Project
OPEC	Organisation of the Petroleum Exporting Countries
PDD	Project Design Documents
R&D	Research and Development
RoW	Rest of the World
SRI	Socially responsible investment
SSSC	Eskom Executive Committee Sustainability and Safety Sub-Committee
tCO_2e	metric tonnes of carbon dioxide equivalent
TMT	Technology, Media and Telecommunications
UN PRI	UN Principles for Responsible Investment
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development
WWF SA	World Wide Fund for Nature South Africa

Notes

Notes

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