



THE REPORTING AND ASSURANCE OF GREENHOUSE GAS EMISSIONS IN SOUTH AFRICA



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ACKNOWLEDGMENTS

This publication is based on a similar publication issued by the Institute of Chartered Accountants in Australia (ICAA) in June 2008. SAICA thanks the ICAA for granting permission to use content from their document.

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FOREWORD

There is an African proverb: *"the earth is not ours, it is a treasure we hold for future generations"*.

In a similar vein, His Royal Highness, the Prince of Wales, has said: *"Few accountants and business decision-makers ask how much of our critical natural resources are left? How many miles of our polar ice-cap have our businesses helped melt this year? By how many inches have we raised sea levels? How many species have we put at risk? How many homes will be flooded? How many people will die of thirst or starvation because of our activities?"*

"These are not comfortable questions but, by God," he urged, *"they need to be asked."*

If one accepts the truth of the African proverb and begins to try and answer the questions asked by the Prince of Wales it becomes immediately obvious that sustainable business is a non-negotiable imperative for all organisations.

In the South African context insufficient focus lies on sustainable business. There is no comprehensive and complete

framework in one place to enlighten individuals about sustainability and all its issues, even though a vast amount of information can be found in a myriad of information channels.

South Africa's private sector needs to be made aware that sustainable development is an issue that profoundly impacts the world economy and is one of the biggest issues facing organisations across the globe.

In serving our members, the SAICA management team decided it was important to share sustainable development guidelines, tools and information with members so as to assist the CA(SA) to understand, strategise and effectively plan around the impact sustainable development could have on them and their organisations.

SAICA, therefore, adopted as one of its strategies and objectives, the responsibility to do just this. Both for the benefit of the organisation and in order to position the CA(SA) as knowledgeable in this area so as to maintain their reputation as highly regarded business leaders.

To date SAICA has hosted introductory breakfast sessions on sustainability, and we are also in the process of publishing a book entitled **"Green - Why corporate leaders need to embrace sustainability to ensure future profitability"**. In addition, we will offer sustainable development workshops, as well as training in the Global Reporting Initiatives.

This guideline, **"The Reporting and Assurance of Greenhouse Gas Emissions in South Africa"**, is the second in a series of thought leadership pieces and aims to assist our members, and the public, with sustainability issues.

I believe this guideline is especially timely given that the profile of sustainable development, which requires the measurable impact of carbon emissions to be assessed, will soon be heightened by King III, in which SAICA and its members are playing an active role.

It was Mahatma Gandhi who said: *"The future depends on what we do at present."*

I therefore urge all our valued members to adopt sustainable development

as intellectual capital inherent to the leadership qualities of a CA(SA) – for the benefit of today's and future generations.

IGNATIUS SEHOOLE
Executive President
SAICA

January 2009

EXECUTIVE SUMMARY

International publications such as the Fourth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) and the Stern Review have highlighted the scientific evidence that climate change poses serious global risks, and the benefits of strong and early action far outweigh the economic costs of inaction.

Africa has been identified as one of the continents most vulnerable to the impacts of climate change, with all major economic sectors facing huge impacts exacerbated by existing development challenges.

The United Nations Framework Convention on Climate Change (UNFCCC) was established in 1992 with the aim of stabilising Greenhouse Gas (GHG) emissions and preventing dangerous anthropogenic interference with the climate system. In 1997, the Kyoto Protocol was developed under the UNFCCC in order to set definite and binding targets for emission reductions. South Africa ratified the Kyoto Protocol in 2002 and is considered a non-Annex 1 country with no binding emission

reduction targets due to the fact that it is a developing country. However, South Africa is one of the largest emitters of GHGs globally relative to the size of its population and economy. Thus action to reduce GHG emissions by the country will be required in the near future.

The South African government has recently developed scenarios to determine what actions are feasible to reduce emissions by 2050 and is exploring the option of introducing a carbon tax and mandatory energy efficiency measures. It is expected that by 2012 South Africa will have implemented climate change laws, however, at present there are no regulations or legislation that organisations have to abide by.

The potential financial implications of climate change on organisations is receiving increasing attention and recognition at international and local levels. Various stakeholders are requiring organisations to identify, measure and report on climate change risks and GHG emissions. Disclosures



can be done through specific initiatives such as the Carbon Disclosure Project (CDP) or within sustainability reports and regulatory returns. A survey of the Financial Times Top 500 Companies (FT500) showed that the largest companies in Africa featured on the FT500 list disclose very little climate change related information. The second CDP survey held in 2008 found a growing awareness of climate change risks and opportunities amongst South African businesses; however, a significantly higher level of ambition is needed by companies and investors on this matter.

This guideline looks at the four different aspects of GHG management within an organisation: the measurement of emissions, reducing and offsetting emissions (through the compliance and voluntary markets), reporting, disclosing and verifying emissions, and emission reductions. GHG management is important for the purposes of monitoring regulatory compliance, facilitating emissions trading schemes and assisting management and investor decision making. Although assurance

organisations and professionals would be mostly interested in the reporting and verification of GHG emissions, it is imperative that they understand all aspects of GHG management, including how an organisation identifies and measures its emissions. Assurance teams involved in GHG emission projects need to be multi-disciplinary and comprise not only auditing professionals, but also individuals with environmental or engineering experience.

There is currently no accounting standard issued by the accounting profession regarding GHG emissions disclosures. However, there are international standards and guidelines such as the Greenhouse Gas Protocol, ISO 14064 and the newly released PAS2050:2008 that provide information for companies and assurance providers regarding reporting emissions and emission reductions and the assurance of emission disclosures. The International Auditing and Assurance Standards Board is currently undertaking a project to develop a standard from within the assurance profession pertaining to GHG emission assurance.

Because climate change is one of the biggest issues facing the world today, organisations need to realise the importance of measuring GHG emissions, implementing reduction and offset projects, monitoring reductions accurately and then disclosing assured information through public media.

There is a real need for the most relevant, reliable and unbiased information to be made available for informed decision making at an organisational level regarding climate change. Accordingly, the assurance of GHG emissions inventories is key. South Africa has no binding targets under the Kyoto Protocol and no national legislation enforcing the disclosure of GHG inventories. This situation may change in the near future and both assurance organisations and business in general have to start preparing themselves for change. This guideline is a first step in ensuring that accounting and auditing professionals better understand climate change, GHG emission measurements and reporting, and the role they can play in this field.



INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report published in 2007 highlighted the scientific evidence that climate change presents very serious global risks that demand an urgent global response. The report further highlights Africa as one of the most vulnerable continents to climate change and climate variability, with the major economic sectors facing huge impacts exacerbated by existing development challenges (IPCC, 2007).

The Stern Review (2006) notes that climate change “must be regarded as market failure on the greatest scale the world has ever seen”¹ and concludes that “the benefits of strong and early action far outweigh the economic costs of not acting”². The primary focus of the actions recommended by the Stern Review is the reduction of carbon emissions by the adoption of strategies such as carbon pricing and technological development.

The purpose of this guideline is to outline the processes involved in carbon management at an organisational level, including:

- measuring and reporting GHG emissions.
- reducing or offsetting emissions, and
- disclosing and assuring emissions as well as emission reductions.

From an auditing and assurance perspective, the reporting and verification of emissions and emission reductions is key, however, it is important to understand the broader processes involved in carbon management as well as the current situation in terms of climate change mitigation. Thus the first section of the guideline examines the state of policy development in South Africa regarding the broad issue of climate change, followed by the current state of GHG reporting both internationally and in South Africa. Subsequent sections detail the different aspects of carbon management including the accounting and reporting standards and the development of assurance standards for GHG emissions disclosures.

1. Stern Report 2006, Section 2.2, page 25
2. Stern Report 2006, Summary of Conclusions, page 6



WHAT IS CLIMATE CHANGE?

The natural greenhouse effect, where the atmosphere traps and holds a certain amount of solar radiation, enables life on earth to evolve and survive. Without this effect the average temperature on earth would be -18°C , rather than the current average of 15°C . However, humans have caused a phenomenon referred to as the enhanced greenhouse effect, which is causing a greater volume of solar radiation to be trapped, thus raising the earth's temperature. The major cause of this change is an increase in GHGs in the atmosphere due to industrial processes, the burning of fossil fuels such as coal and oil, and global deforestation. The main GHGs are carbon dioxide (which accounts for more than half of all warming), methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons. These gases have a long lifespan in the atmosphere, ranging from a few decades to many centuries, which means that GHGs emitted since the industrial age began are still trapping heat and contributing to changes in the climate (Dow and Downing, 2006).

The Fourth Assessment Report of the IPCC concluded that Africa is very likely to experience greater warming in all seasons during this century than the expected global, annual mean warming. Annual rainfall is also likely to decrease over much of the continent, although current regional models for Africa have limitations due to empirical downscaling results not being fully understood (IPCC, 2007). Impacts of increasing temperatures and changes in rainfall patterns include:

- Decreasing agricultural yields and greater food insecurity.
- Decreased water availability.
- Spread of water-borne diseases such as malaria.
- Ecosystem disruptions.
- Rising sea levels leading to the destruction of infrastructure. (Dow and Downing, 2006)

In 1992, in response to growing scientific evidence, the UNFCCC was established with the aim of stabilising GHG emissions "at a level that would prevent dangerous anthropogenic interference with the climate system".

In 1997, under the UNFCCC, the Kyoto Protocol was established in order to set definite targets for emission reductions. The Protocol came into force in February 2005. The Kyoto Protocol divides countries into two categories:

- Developed countries with set and binding emission reduction targets, referred to as Annex 1 countries.
- Developing countries with no binding emission reduction targets during the first commitment period from 2008 - 2012, referred to as non-Annex 1 countries. (Dow and Downing 2006).



THE STATUS OF CLIMATE CHANGE POLICY DEVELOPMENT IN SOUTH AFRICA

"It is now clear that only action by both developed and developing countries can prevent the climate crisis from deepening. While developed countries bear most of the responsibility for causing the problem to date, developing countries – including South Africa – must face up to our responsibility for the future. Whilst we have different historical responsibilities for emissions, we share a common responsibility for the future."

(Van Schalkwyk, M; Minister of Environmental Affairs and Tourism 2008)

Under the Kyoto Protocol (ratified by South Africa in 2002), South Africa is a non-Annex 1 country and therefore does not have binding emission reduction targets for the first commitment period between 2008 and 2012. Although there are currently no regulation and compliance requirements regarding GHG emissions reporting by companies, the government recognises that South Africa is one of the largest emitters of GHGs globally relative to the

population and economy and that future actions will be necessary. In 2004, South Africa developed the National Climate Change Response Strategy to support policies and principles laid out in relevant sectors including energy, agriculture, water, pollution and waste management that will be impacted by climate change. The key issues highlighted in the Strategy include:

- Supporting national and sustainable development.
- Adapting to climate change.
- Developing a sustainable energy programme.
- Meeting international obligations and domestic legal obligations.
- Integrating climate change response in government.
- Research development and demonstration.
- Accessing and managing financial resources for climate change.
- Climate change related education and training.

- Greenhouse gas inventories (Department of Environmental Affairs and Tourism (DEAT), 2004)

In 2007, the Long-Term Mitigation Scenario (LTMS) was released consisting of a comprehensive study conducted by the government with input from relevant external stakeholders in order to provide sound scientific analysis to be used for drawing up a long-term climate policy. The strategy outlines two possible scenarios for future action, namely "Growth without Constraints" – no mitigation before 2050 and "Required by Science" – full scale mitigation. The LTMS predicted that without constraints South Africa's emissions may quadruple by 2050 and thus the business as usual scenario is simply unsustainable. The "Required by Science" scenario indicates that large emission reductions will have to be achieved through a co-ordinated mitigation programme at the national level with appropriate international assistance and a high degree of planning (DEAT, 2007).

Figure 1 (on the next page) illustrates the fundamental differences between the two scenarios and includes the actions that could be taken under the "Required by Science" scenario. According to the South African government, measures have to be implemented to ensure GHG emissions are stabilised between 2020 and 2025 and that absolute emission reduction begins ten years after their growth has been halted. In addition, the government is currently investigating a carbon tax and looking to make energy-efficiency measures mandatory. Taking into account the strategies mentioned above, the draft plans pertaining to pricing carbon and ensuring emissions are stabilised by the latest 2025 will be issued in 2009 and new climate change laws are expected to be in place by 2012 (Carbon Positive News, 2008).

FIGURE 1: A COMPARISON BETWEEN THE SCENARIOS OUTLINED IN THE LTMS (DEAT, 2007)

"GROWTH WITHOUT CONSTRAINTS" SCENARIO

1. Overall fuel consumption grows more than five-fold, mainly in the industrial and transport sectors.
2. No incentive for energy efficiency.
3. Due to no carbon constraints, no new electricity plants have carbon capture and storage potential.
4. Very few renewable energy sources in the overall energy mix.
5. Liquid fuel is dominated by oil and synfuel.
6. Patterns of human consumption of energy and goods has not changed from the current development pathway.

"REQUIRED BY SCIENCE" SCENARIO

1. New technologies dominate the electricity generation and transport sectors.
2. Nuclear and renewable technologies taken up on a large scale.
3. Large scale investment in new technologies at an international level.
4. Energy efficiency is an integral part of all sectors.
5. Widespread changes in human behaviour through increased awareness and the adoption of a low carbon lifestyle.



THE CURRENT STATE OF INTERNATIONAL AND NATIONAL GREENHOUSE GAS REPORTING

The potential financial implications of climate change on business is receiving increasing attention and recognition at both international and local levels. Investors, customers and other stakeholders are requiring companies to identify, assess and report publicly on the financial implications of climate change to their business. This is evident in various forums and initiatives such as the Carbon Disclosure Project, Institutional Investor Group on Climate Change (IIGCC), the Investor Network on Climate Risk (INCR) and the Global Framework for Climate Risk Disclosure. In addition to these forums, GHG emissions may be disclosed within sustainability reports, regulatory returns, as a note to an entity's financial statements, as well as public GHG registries such as the Chicago Climate Exchange and the California Climate Action Registry (GRI, 2007 and WBCSD & WRI, 2007).

Climate Change and Sustainability Reporting

A study was conducted by KPMG and the Global Reporting Initiative (GRI) on sustainability reports issued in 2005 on a sample of 50 organisations from the FT500 which incorporated the GRI Guidelines. The results showed that although 90% of the organisations reported on climate change, only 20% reported on the risk to their business. The predominant risk reported was the risk of increased energy costs, whilst other risks such as complying with new regulations, weather-related property damage, increased insurance costs, and corporate reputation were largely ignored. The low reporting of risks could be due to these risks being perceived to be beyond current business planning horizons or the organisations at the time had not identified, explored or quantified the risks. Despite the lack of reporting on the risks associated with climate change, the majority of the surveyed organisations reported on new business opportunities related to emissions trading and the generation

of carbon credits under the Kyoto Protocol's flexible mechanisms (GRI, 2007).

The Corporate Climate Change Communication Report (Corporate Register, 2008) examined climate change disclosures within the FT500 companies including mitigation measures and communication methods used. Of the global FT500 companies, 335 (67%) publish Corporate Social Responsibility (CSR) reports. Of these CSR reports:

- 65% included a specific climate change section.
- 41% addressed climate change in the CEO/Chairman's introduction.
- 16% outlined where management responsibility for climate change issues are.
- 78% of reports disclosed quantitative emissions data.
- 63% of reports were aligned with the GHG Protocol (used to calculate and report emissions).
- Mitigation measures reported were: energy efficiency (74%), renewable

energy (46%), transport initiatives (35%) and emissions trading (34%).

- 37% of reports set out specific, measureable, time-scaled targets to reduce emissions, while 14% included broader objectives.
- 7% of reports included assurance statements specifically covering climate change, over and above general assurance of the full report.

Twelve of the FT500 companies are located in Africa and of these, only five produced sustainability reports during the study period. Of all the companies investigated in the survey, the reports from Africa contained the least climate change information and disclosures. The emphasis on mitigation measures in Africa focused predominantly on emissions trading (linked to the Clean Development Mechanism) and energy efficiency.

These statistics demonstrate how the top companies worldwide are starting to take climate change seriously as a business challenge. However, despite the fact that most companies mention climate

change and are beginning to disclose quantitative emissions, few companies have set definite targets and even fewer have had their reports assured specifically for climate change criteria.

Carbon Disclosure Project – South Africa

The Carbon Disclosure Project (CDP) is an independent not-for-profit organisation which, since 2000, has acted as an intermediary between shareholders and corporations on all climate change related issues and has provided primary climate change data from the world's largest corporations to the global market place. The CDP plays a vital role in encouraging private and public sector organisations to measure, manage and reduce emissions and climate change impacts³. At a global level the 2008 CDP sent questionnaires to more than 3 000 of the world's largest corporations (with market capitalisation of US\$22 trillion) and the results are being published in more than 20 countries (CDP, 2008).

The National Business Initiative (NBI) undertook the first CDP in South Africa

in 2007 with a focus on the JSE Top 40 companies. The 2008 survey was expanded to include the JSE Top 100 companies. The overall response rate in 2008 was 59%, which compares favourably with the rate experienced in most other CDP-participant countries. The survey was balanced between carbon-intensive and low-carbon sectors, although the response rate in some sectors, such as real estate, leisure, entertainment and hotels, and media and publishing was poor. The disclosure of actual GHG emissions increased from 57% in 2007 to 77% in 2008. In 2007, the carbon-intensive sectors had a low level of emissions disclosures, however in 2008, the disclosure rate in these sectors was 88% (See figure 2).

The CDP found a growing awareness among South African companies of the business risks and opportunities associated with climate change. Many of the responding companies acknowledged that the government is expected to introduce climate change regulations in the near future. Such regulations will level the playing field and make efficiency and

environmental best practice more attractive. With carbon caps or taxes inevitable in the future, companies are beginning to work with government bodies and industry peers on national policies relating to climate change. While most responding companies have developed or are implementing formal systems for measuring and reporting their GHG emissions, important gaps remain in emissions management, management execution and dedicated board oversight. Most companies currently lack structured systems for carbon management and only 23% of the responding companies have specific, company-wide GHG emission reduction targets in place. Most companies with emission targets in place have focussed on reducing their emissions intensity, rather than striving for a reduction in absolute emissions.

If South Africa's emissions are to peak and 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. Overall, the survey found that although there have been some encouraging improvements

since 2007, 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 (NBI, 2008).



FIGURE 2: THE SOUTH AFRICAN CARBON DISCLOSURE LEADERSHIP INDEX (CDLI):

As part of the CDP in 2008, the CDLI recognises companies with leading disclosure practices. Companies were grouped according to their carbon intensity.

CARBON INTENSIVE SECTORS

- | | |
|--------------------------------|----------------------------|
| 1. BHP Billiton | General Mining |
| 2. Gold Fields | Gold Mining |
| 3. AngloGold Ashanti | Gold Mining |
| 4. Sasol | Integrated Oil & Gas |
| 5. Exxaro Resources | General Mining |
| 6. Northam Platinum | Platinum & Precious Metals |
| 7. Anglo American | General Mining |
| 8. Remgro | Diversified Industrials |
| 9. Murray and Roberts Holdings | Heavy Construction |
| 10. The Bidvest Group | Business Support Services |

LOW CARBON SECTORS

- | | |
|----------------------------|------------------------------|
| 1. Woolworths Holdings | Broadline Retailers |
| 2. Dimension Data Holdings | Computer Services |
| 3. Massmart Holdings | Broadline Retailers |
| 4. Nedbank Group | Banks |
| 5. Pick 'n Pay Holdings | Food Retailers & Wholesalers |
| 6. SABMiller | Brewers |
| 7. Medi-Clinic Corp | Health Care Providers |
| 8. Liberty Group | Life Insurance |
| 9. FirstRand | Banks |
| 10. Standard Bank Group | Banks |





The Johannesburg Stock Exchange Socially Responsible Investment Index (JSE SRI)

The King II Report on Corporate Governance urged companies to embrace the triple bottom line (social, economic and environmental) approach as a method of doing business. Thus, in May 2004, the JSE developed criteria to measure the triple bottom line performance of companies in the FTSE/JSE All Share Index. The SRI Index offers a sustainability benchmark and recognises the listed companies that have incorporated sustainability principles into everyday business practices. Additionally the index serves as a tool for investors to assess companies on a broader basis. The criteria used in the index includes an analysis of direct impacts of not only climate change but also air and water pollution, waste generation and water consumption. Detailed criteria relating to climate change is in the process of being developed for use in future reviews (JSE, 2007a). In 2008, 105 companies were reviewed for the index, and 61 of these became constituents. The 105

companies reviewed in 2008 constitute approximately 85% of the JSE's market capitalisation and make up the largest number of companies ever assessed in the annual review (JSE, 2008). The 2008 Index includes the following Top 21 companies (See Figure 3).

FIGURE 3: 2008 JSE SRI INDEX TOP COMPANIES (JSE.2008)

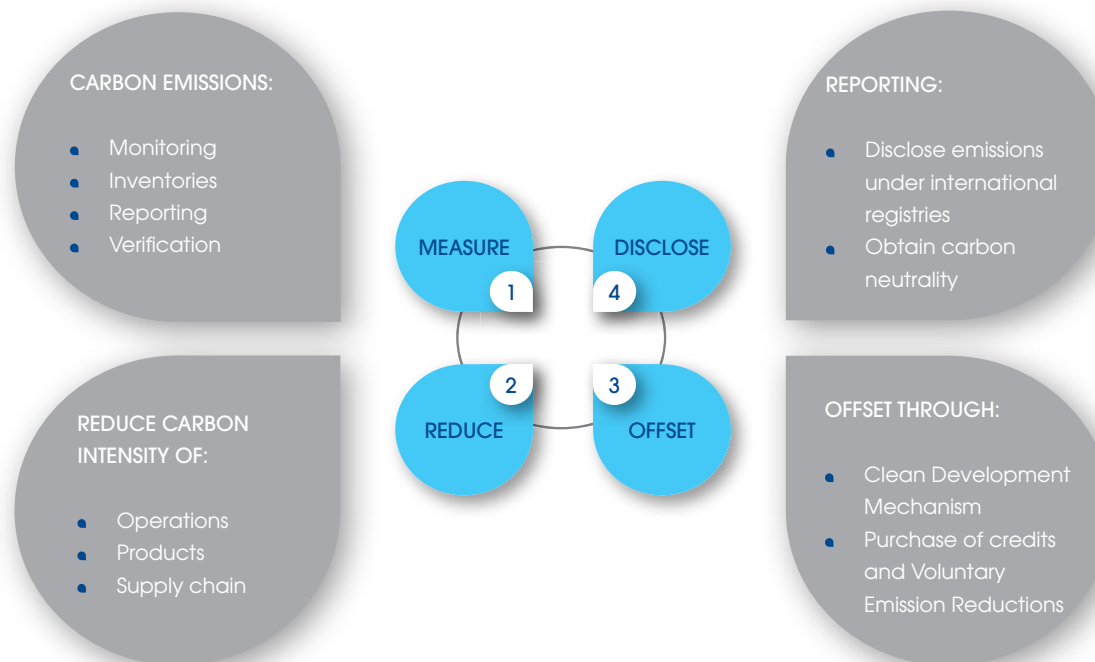
- ABSA Group
- African Bank Investments
- Anglo American
- AngloGold Ashanti
- Aveng
- The Bidvest Group
- Discovery Holdings
- Exxaro Resources
- Foschini
- Gold Fields
- Group Five
- Highveld Steel and Vanadium
- Illovo Sugar
- Impala Platinum Holdings
- Lonmin
- Massmart Holdings
- Nampak
- Netcare
- Sanlam
- Sappi
- Standard Bank Group
- Tongaat Hulett

STRATEGICALLY MANAGING AN ORGANISATION'S GHG EMISSIONS

A GHG management strategy is a short- or long-term plan designed by an organisation to achieve its goals and targets set in terms of GHG emissions management and reduction. The development of a realistic and sound GHG management strategy is based on four pillars, namely: measurement, reduction, offset and reporting (See Figure 4). GHG management is important for the purposes of monitoring regulatory compliance, facilitating emissions trading schemes, and aiding management and investor decision making. It can also be seen as part of a broader trend with companies adopting corporate social

responsibility business models and triple bottom line reporting practices. To the auditing and assurance profession, the reporting and verification aspects of a GHG management strategy may seem the most relevant; however it is important to understand the entire process of calculating a GHG emissions inventory (more commonly referred to as a carbon footprint) and the processes involved in reducing or offsetting the emissions. The following sections will examine the four pillars in more detail and elaborate on the role the auditing and assurance profession can play.

FIGURE 4: KEY STEPS IN AN ORGANISATION'S GHG MANAGEMENT STRATEGY (ASSOCHAM AND ERNST & YOUNG INDIA, 2007)



MEASURING AN ORGANISATION'S GHG EMISSIONS INVENTORY

The first step in managing an organisation's GHG emissions is to measure the emissions resulting from their processes and activities. The calculation of a GHG emissions inventory consists of:

- Step 1: Identifying the GHG emission sources.
- Step 2: Selecting a GHG emission calculation approach.
- Step 3: Collecting activity data and determining relevant emission factors.
- Step 4: Calculating the total GHG emissions.
- Step 5: Verifying and disclosing the footprint (optional).

As in the accounting and assurance profession, certain principles need to be adhered to for GHG quantification and reporting (WBCSD & WRI, 2007). These principles and characteristics are outlined in Figure 5.

There is currently no accounting standard issued by the accounting profession regarding GHG emissions disclosures. However, outside of the

accounting profession there are various other reporting schemes in existence. In 2007, the World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) issued a revised version of the internationally accepted Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (GHG Protocol). This Protocol covers the same six GHGs included in the Kyoto Protocol - carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆) (WBCSD & WRI, 2007).

As with financial accounting and reporting, generally accepted principles are needed to guide GHG accounting and reporting to ensure that reported information represents a true and fair account of a company's GHG emissions. Although GHG accounting and reporting practices are still evolving and are thus new to many businesses, the approach used is based on the universal accounting principles of relevance, completeness, consistency, transparency and accuracy.

The GHG Protocol provides guidance for organisations in terms of setting organisational and operational boundaries, defining the GHGs that

are covered, and the measurement and calculation of the GHG emissions associated with an organisation's activities. These aspects of the Protocol

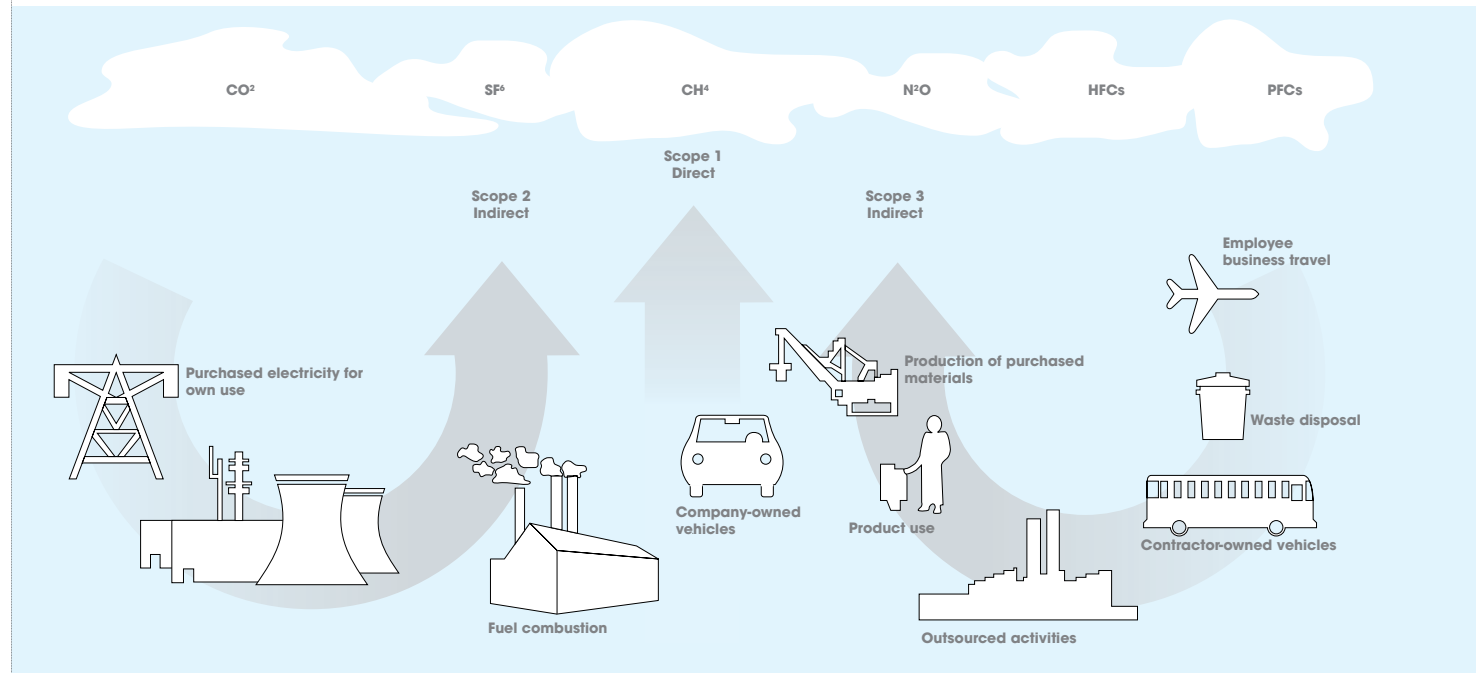
FIGURE 5: ACCOUNTING AND REPORTING PRINCIPLES (WBCSD & WRI, 2007)

Relevance	Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
Completeness	Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
Consistency	Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods or any other relevant factors in the time series.
Transparency	Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
Accuracy	Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

need to be addressed in a reporting framework and agreed before criteria can be deemed to be suitable and assurance can be provided.

The GHG Protocol uses the concept of “scope” in order to delineate between different sources of GHG emissions and to assist in the accurate accounting and reporting of all applicable emissions. Scope 1 refers to direct emissions from sources owned or controlled by the reporting organisation, scope 2 are indirect emissions from the consumption of purchased electricity, heat or steam generated by another organisation, and scope 3 are other indirect emissions generated in the wider economy from business travel and the wider supply chain of products and services (see Figure 6 for a more detailed description of the scopes). Scope 1 and 2 emissions are carefully defined in the Protocol to ensure that different companies will not account for emissions in the same scope. It is expected that companies will separately account for and report on scope 1 and 2 emissions, and may optionally report scope 3 emissions (WBCSD & WRI, 2007).

FIGURE 6: OVERVIEW OF GHG EMISSIONS SCOPES (WBCSD & WRI, 2007)



The International Organisation for Standardisation (ISO) released ISO 14064-1 in 2006, which provides guidance on the quantification, monitoring and reporting of organisational greenhouse gas emissions (ISO, 2006a). The GHG Protocol and ISO 14064-1 are very similar, with the ISO standard being based on an earlier version of the GHG Protocol.

In October 2008, BSI (British Standards) released PAS 2050:2008 - a specification for the measurement of the embodied greenhouse gas emissions in products and services. The aim of the new standard is to help businesses move beyond managing the emissions from their own processes and to look at the opportunities for reducing embodied emissions in the design, manufacture and supply of their products (refer to Figure 7 for examples from testing of the new standard). PAS 2050 recognises the potential for companies to use this method to better understand the GHG implications of their supply chains and to provide a common basis of measurement for the comparison and communication of results (BSI, 2008).

PAS 2050 provides the following benefits for business and consumers:

- Allows internal business assessment of existing supply chains.
- Facilitates the evaluation of alternative product configurations, sourcing and manufacturing methods and raw material choices.
- Provides a benchmark for ongoing business programmes aimed at reducing GHG emissions over time.
- Allows for a comparison of products using a common, recognised and standardised approach to supply chain emissions assessment.
- Provides a common basis from which the results of embodied GHG emissions assessments can be reported and communicated to stakeholders, including consumers, and
- Provides an opportunity for greater consumer understanding of the GHG implications of purchasing decisions and incentives to change purchasing decisions on the basis of this information (BSI, 2008).

FIGURE 7: RESULTS FROM THE INITIAL TESTING OF PAS 2050

The Carbon Trust began testing the new standard in 2007 with 75 products from a range of companies. Results include:

- Boots reducing the carbon footprint from the production of its Botanics shampoo by 10%.
- Innocent (a natural fruit drink company) reduced its waste-to-landfill by 54% after identifying an opportunity for its supplier to look at increasing the amount of waste material being recycled through the factory (Environmental Leader, 2008).



REDUCING AND OFFSETTING GHG EMISSIONS

The carbon market consists of two separate markets referred to as the compliance market and the voluntary market. The compliance market is created and regulated by mandatory national, regional or international carbon reduction regimes (such as the UNFCCC). The compliance market's projects produce Certified Emission Reductions (CERs) which can be traded on the carbon market. The voluntary market consists of projects operating outside the compliance system and credits from such projects are sold as Voluntary Emission Reductions (VERs). VERs are generally bought by organisations with no mandatory reduction targets that are interested in reducing their footprint for philanthropic or public relations benefits, or in preparation for future regulatory requirements (Kollmuss, Zink & Polycarp, 2008).

The Kyoto Protocol has established three flexible mechanisms (Joint Implementation, Emissions Trading and the Clean Development Mechanism) that help countries meet their emission reduction obligations (as laid out in the

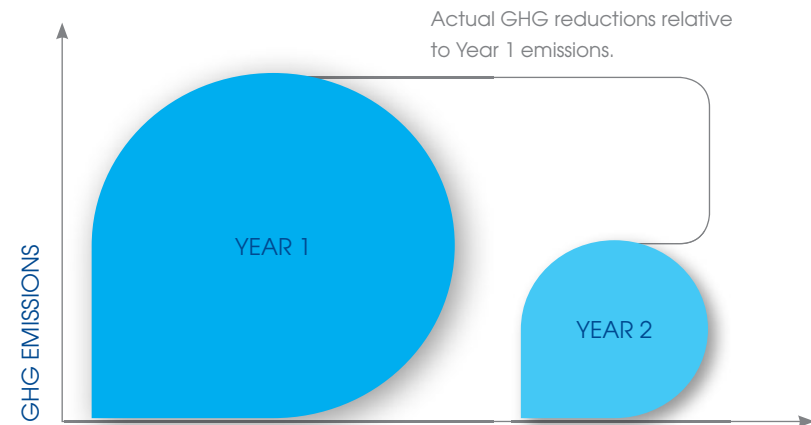
Protocol) at the lowest possible cost. The Clean Development Mechanism (CDM) is the flexible mechanism applicable to developing countries which do not have any binding emission reduction targets. The CDM helps developed countries achieve their domestic emission reduction targets under the Kyoto Protocol through investment in emission reduction projects in developing countries for which they then obtain CERs. The benefits of the CDM for developing countries includes: the transfer and implementation of cleaner technology options and financing for projects that would otherwise not have been viable. The CDM process is very stringent and projects have to submit detailed documentation using specific methodologies to the UNFCCC for projects to be validated and for subsequent emission reductions to be verified.

Various mechanisms exist within the voluntary market which allow project developers to be more flexible in implementing projects that may not be viable under the compliance market. In

the past the voluntary market received much criticism about the poor quality of carbon offset projects and thus mechanisms such as the Voluntary Carbon Standard (VCS) have become increasingly rigorous and transparent (Kollmuss, Zink & Polycarp, 2008). Figure 8 illustrates how GHG emissions can be reduced from one year to the next due to voluntary offsetting or CDM reduction projects.



FIGURE 8: GHG EMISSION REDUCTIONS RELATIVE TO A BASELINE (WBCSD & WRI, 2005)



A growing number of companies are utilising carbon offset options as a corporate or marketing strategy. This capitalises on the desire of certain individuals (most commonly customers) to reduce their personal carbon footprint by, for instance, offsetting the emissions generated from their personal air travel. Examples of these types of offset programmes are contained in Figure 9.

The GHG Protocol has developed Project Accounting Guidelines to quantify and report emission reductions. The guidelines outline the procedure for reporting GHG reductions including:

- The necessary information about the reduction project.

- The assessment boundary.
- Baseline emissions for the project activity.
- Estimated GHG reductions.
- A monitoring plan and annual monitoring and GHG reduction quantification reports. (WBCSD & WRI, 2005)

ISO has developed a standard (ISO 14064-2) which focuses on quantifying, monitoring and reporting project emission reductions. The standard includes guidance on determining the baseline scenario, quantifying GHG reductions, managing data quality, monitoring plans as well as verifying and reporting the reductions (ISO, 2006b).

FIGURE 9: EXAMPLES OF GHG OFFSET PROGRAMMES IN SOUTH AFRICA

KULULA

A low-cost domestic airline in South Africa gives its customers the option of donating money (R20 to R200) towards tree planting initiatives at rural schools around the country in order to offset GHG emissions from their flights. There are no calculations to specifically determine the carbon footprint of each flight, however, the donations are used to offset the airlines emissions in general.

FLIGHT CENTRE

A worldwide travel consultancy company has partnered with Cleaner Climate (an international NGO involved in renewable energy and energy efficiency projects) to allow travellers to calculate their carbon emissions resulting from air travel using an online calculator and then offset these emissions by making a donation to one of Cleaner Climate's projects. Once a traveller's donation has been received they are given an offset certificate from Cleaner Climate verifying the carbon offset. The primary project used for offsetting is a 1.2MW wind farm in Karnataka, India, that was developed under the CDM. Cleaner Climate is also involved in renewable energy projects in conjunction with the Central Energy Fund in Johannesburg and Cape Town.

DISCLOSURES OF GHG EMISSIONS INVENTORIES

Companies disclose their inventory of GHG emissions for the purposes of monitoring regulatory compliance, facilitating Emissions Trading Schemes (ETS), and aiding management and investor decision making. Disclosures of these inventories are verifiable and in many instances they are accompanied by an assurance report from an independent assurer.

As the discussion around carbon emissions continues to gain momentum, there is a desire that companies be, and be seen to be, good corporate citizens. For example, disclosures may be used by companies as a marketing tool by claiming that their operations are, or are moving towards, 'carbon neutrality' by reducing their carbon footprint.

Being a good corporate citizen can carry many benefits, including giving an organisation a distinct sense of identity and increasing the positive perceptions held by employees, customers, suppliers and other stakeholders. However, in order for organisations to avoid their public disclosures being

perceived as 'greenwash', or an attempt to influence people with regard to their sustainability credentials, there is a great benefit for organisations to provide an independent assurance report supporting the claims made in their statements.

There are numerous instances of companies issuing sustainability reports which include their GHG emissions. Many of these reports are issued by transnational companies, and there are very few companies that have the international reach to provide assurance for these organisations other than the large international auditing and assurance firms. Therefore the larger, international firms are well placed to be the assurance providers for these reports.

Voluntary company disclosures

Companies may voluntarily disclose their GHG emissions through participation in various voluntary disclosure schemes, such as the Carbon Disclosure Project. There are also a number of other schemes which have

been set up to encourage disclosure in certain regions of the world, including Japan's Voluntary Emissions Trading Scheme (JVETS) and the California Climate Action Registry (CCAR).

The CCAR has developed a General Protocol which provides detailed guidance on how participants in the registry must disclose their GHG emissions (CCAR, 2007). As with mandatory schemes, the efficacy of these voluntary schemes depends on reliable and accurate emissions disclosures.

Disclosures required by regulations

Regulations are usually imposed nationally or regionally and may require disclosure of GHG emissions inventories by certain companies. Such regulations are commonly associated with policies designed to limit the levels of emissions, either voluntarily or through mechanisms such as taxing schemes, or are associated with emissions trading schemes. In all instances independent assurance would enhance the credibility of these disclosures.

An example of a domestic regulatory disclosure requirement is the US state of New Mexico's mandatory GHG reporting regulations, approved by the Environmental Improvement Board in October 2007. These regulations require that certain industries in New Mexico, including power plants, oil and gas refineries and cement plants, report their emissions from 1 January 2008 (Environmental Leader, 2007). Similarly, the Australian government's National Greenhouse and Energy Reporting System (NGERS) will require the mandatory reporting of GHG emissions and energy consumption and production by Australian corporations (Australian Government Department of Climate Change, 2008).

As mentioned previously, South Africa currently has no binding commitment under the Kyoto Protocol and the government has not implemented mandatory disclosure of GHG emissions.

Disclosures related to Emissions Trading Schemes

A further step toward reducing GHG emissions is the development of emissions benchmarks and Emissions Trading Schemes (ETSs) that allow organisations to buy and sell carbon credits. The rationale behind such schemes is to provide market incentives for emission reduction where the cost

of the reduction is the lowest. The robustness of such schemes will be enhanced by improvements in the measurement, reporting and associated assurance of these emissions.

The ratification of the Kyoto Protocol's 'cap and trade' approach to carbon emissions by most of the developed world (excluding the USA) adds significant impetus to the development

of regional, national and international carbon emissions markets. In recent years numerous ETSs, focused specifically on carbon emissions, other GHGs or a combination thereof, have commenced around the world. The main features of some of these schemes are described in Figure 10. There are currently no ETSs in South Africa due to the lack of regulatory requirements in place.

As more ETSs are introduced throughout the world, well established reporting mechanisms should be designed to assist companies to meet their requirements. With the general acceptance of reporting frameworks, there is no doubt that assurance will play an important role in improving both the quality and credibility of the disclosed information.

FIGURE 10: EMISSIONS TRADING SCHEMES

Scheme	Emissions Covered	Geographical Reach	Emission Sources Targeted	Start	Reporting Requirements	Assurance Requirements
EU ETS	CO ₂	European Union	Large industrial and energy intensive installations	2005	Compliance reporting – binding rules in Monitoring and Reporting Guidelines	There are no EU-wide standards for verification, most member states require third-party verification
CCX	All six greenhouse gases	US, Canada, Mexico, Brazil	Sources in the electric power sector and fossil fuel combustion and process emissions in the manufacturing sector	2003	Emissions are quantified using Continuous Monitoring Systems or an approved alternative and reported on a quarterly basis	FINRA – A leading non-government supplier of financial, regulatory services audits all participants' baseline and annual emissions reports for accuracy, completeness and compliance with the CCX Emissions Reduction Schedule
CCAR	CO ₂ (other GHGs still optional)	California	A wide range of sources	2002	Participants must register their GHG emissions for all operations in California, and are encouraged to report their total emissions in the US or globally	Emissions reports must be certified by an approved certifier to ensure the completeness, consistency, comparability, transparency and accuracy
NSW GGAS	All six greenhouse gases	New South Wales (Australia)	Power generation, energy efficiency, industrial processes and carbon sequestration in forests	2003 (NSW) 2005 (ACT)	Compliance reporting	Annual audit of compliance reporting
Australian Greenhouse and Energy Reporting Scheme (GEDO)	All six greenhouse gases	Australia	Facilities producing more than 25kt CO ₂ equivalents per annum; or aggregate emissions of more than 125kt CO ₂ equivalents (dropping to 50kt CO ₂ equivalents)	July 2008	A registered corporation must provide a report to the GEDO relating to the GHG emissions, energy production and energy consumption from the operation of facilities during that financial year	If the GEDO has reasonable grounds to suspect that a registered corporation has contravened the National Greenhouse and Energy Reporting Act (2007) or regulations, the corporation may be required to appoint an external auditor to ensure compliance with the Act and guidelines

ASSURANCE STANDARDS FOR GHG EMISSIONS INVENTORIES AND GHG EMISSION REDUCTIONS

The auditing and assurance profession is governed by a Code of Ethics, the International Framework for Assurance Engagements, and various standards or statements of practice. These standards can either be used for assurance of historical financial information or for assurance on other than historical financial information. With GHG emission disclosures being non-financial information, the guiding international standard is ISAE 3000 - Assurance Engagements Other than Audits or Reviews of Historical Financial Information. This standard presents the assurance provider with guidance on key stages of the assurance engagement including:

- Ethical requirements
- Quality control
- Engagement acceptance
- Planning
- Suitability of criteria
- Professional scepticism
- Risk and materiality
- Obtaining evidence
- Using experts
- Documentation
- Reporting

ISAE 3000 provides a framework for the provision of assurance on other than historical financial information; however, it does not provide specific guidance for assurance engagements for GHG emissions disclosures. The IAASB is currently addressing this gap and in December 2007 announced it is undertaking a project regarding assurance engagements on information related to GHG emissions reporting and trading. The scope of the project includes the development of requirements and guidance with respect to the auditor's responsibilities for assurance engagements on GHG emissions information, including the form and content of the assurance report. Some of the issues the project is expected to consider include:

- Suitability of criteria
- Level of assurance
- Evidence gathering procedures
- Using the work of an expert
- Form and content of the assurance report (IAASB, 2008)

As outlined earlier, the accounting for carbon emissions has evolved

considerably over the past few years, and there is much greater agreement today as to the suitability of criteria. Verification and assurance can be conducted at two stages in the carbon management cycle – first, at the GHG emission measurement phase where an organisation has quantified its total GHG emissions and second, following the implementation of GHG emission reduction projects.

The GHG Protocol (as the most recognised international guideline on GHG accounting and reporting) includes a chapter on the verification of GHG emissions. The Protocol provides guidance for organisations and external verifiers in relation to materiality, the risk of material discrepancy, establishing the verification parameters, site visits and the timing of the verification (WBCSD & WRI, 2007).

If an organisation has implemented a CDM project under the Kyoto Protocol then the project can only be validated

and the emission reductions verified by a Designated Operational Entity (DOE). A DOE is either a domestic legal entity or an international organisation accredited by the Executive Board of the UNFCCC. A DOE verifies emission reductions of a registered CDM project activity and requests the Executive Board to issue Certified Emission Reductions accordingly.

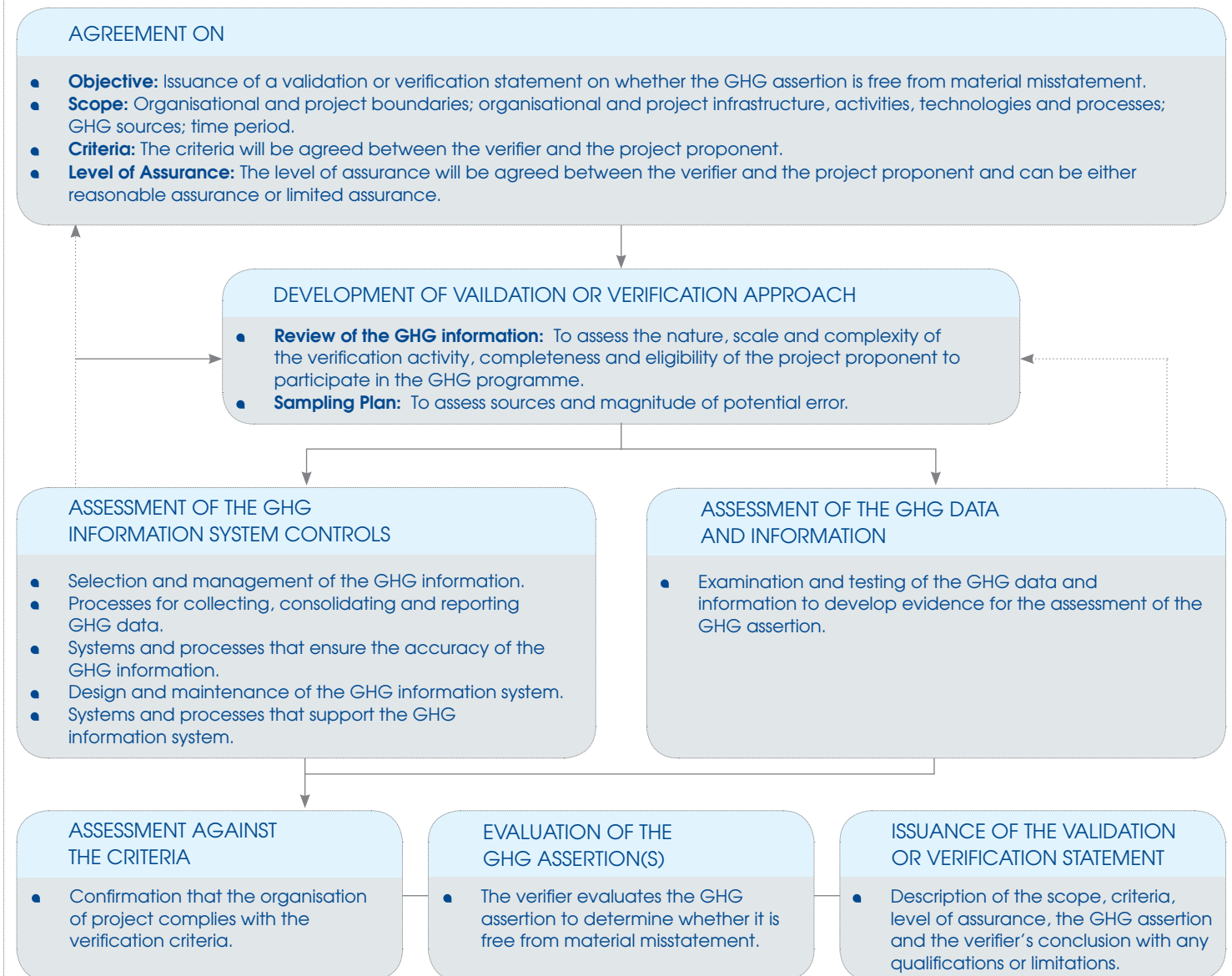
Voluntary standards such as the VCS are increasingly requiring verification of project offsets by third-party auditors. As with the compliance market, two separate assurances are required:

- Validation of the project (to ensure that all requirements of the standard are met), and
- Verification (ensuring the actual emission reductions are valid and accurate). However, unlike the UN system where validation and verification processes are rigorously reviewed by the Executive Board, no such structures for review currently exist in the voluntary market. The different voluntary

standards do, however, require auditors to be familiar with the standards or registered as a DOE. Thus DOEs can validate and verify both CDM and voluntary projects (Kollmus, Zink & Polycarp, 2008).

The ISO has produced a standard, ISO 14064-3:2006, which specifies principles and requirements and provides guidance for those conducting or managing the validation and/or verification of GHG reduction assertions. It can be applied to organisational or project quantification, monitoring and reporting carried out in accordance with ISO 14064-1 or ISO 14064-2. ISO 14064-3 (see Figure 11), which specifies requirements for selecting carbon emission validators/verifiers, establishing the level of assurance, objectives, criteria and scope, determining the validation/verification approach, assessing carbon emissions data, information, information systems and controls, evaluating carbon emissions assertions and preparing validation/verification statements (ISO, 2006c). This standard is complemented by the ISO 14065:2007, which specifies principles and requirements for bodies that undertake validation or verification of GHG assertions.

FIGURE 11: VERIFICATION/VAlIDATION OF GHG ASSERTIONS UNDER ISO 14064-3 (AMENDED FROM ISO, 2006C)



The role of the auditing and assurance profession in assuring GHG emissions disclosures

An issue frequently raised is whether the auditing and assurance profession is the appropriate provider of assurance on GHG emissions disclosures. Whilst there are certain benefits to having auditors involved in the assurance of GHG emissions (which are elaborated on below), it is important to realise that a multi-disciplinary team is necessary for such scientifically technical engagements.

Some of the benefits of engaging the auditing and assurance profession for these services include:

- The training and expertise in evidence collection and assessing information provided against suitable criteria.
- Stringent quality control procedures at the level of individual firms, engagement level and across the profession.
- Strict ethical codes relating to auditor independence and other ethical considerations.

- The training to not only evaluate information provided, but also to evaluate completeness and enquire what information or evidence has been omitted or overlooked.
- The global reach of the international accounting firms, especially in terms of engagements undertaken in multiple locations.

These benefits help increase public confidence in the competency and legitimacy of the auditing and assurance profession as assurance providers. However, many major firms in the profession are developing teams that comprise not only auditing professionals, but also engineers, energy specialists, environmental scientists and health and safety experts, in order for a host of engagements (including assurance on GHG disclosures) to be carried out effectively.

Of course, the above listed advantages can carry related costs: requiring extensive quality control, due processes and other benefits of the profession

can mean that a larger fee may be associated with having assurance provided by members of the profession as opposed to other providers who do not have to meet these requirements.





CONCLUSION

This thought leadership guideline has outlined the current developments in South Africa regarding climate change. It has elaborated on the future legislative actions that may be implemented in South Africa, such as a carbon tax and mandatory energy efficiency measures. Recent developments and statements from the government have demonstrated that the country needs to take climate change seriously and start playing an active role in stabilising and reducing GHG emissions.

This realisation is gradually leading to more and more organisations voluntarily measuring their GHG emissions and seeking ways to reduce or offset emissions stemming from their activities. The next step in the process is to disclose GHG information through platforms such as the CDP and annual sustainability reports. However, research has shown that business has a long way to go before climate change is adequately reported on and emission reduction targets are implemented and disclosed.

The main aim of this guideline is to examine all aspects of carbon management within an organisation, and not simply focus on the reporting and verification aspect which is most applicable to the accounting and assurance profession. As mentioned, it is vital that assurers of GHG emissions understand the entire process and that a holistic approach is taken. Thus the emphasis for assuring this type of information must be on a multi-disciplinary team from scientific and technical backgrounds as well as the auditing profession. The guideline notes the different accounting standards currently being used in the audit profession in general, as well as specifically for GHG emissions. Guidelines from the GHG Protocol and ISO outline processes for reporting and verifying GHG emissions and emission reduction; however, suitable assurance criteria are still evolving.

Climate change is such an important issue to the world today that we need to be emphasising the importance of measuring GHG emissions, implementing reduction and offset

projects, monitoring these reductions accurately and then disclosing verified information through a number of mediums. There is a very real need for the most relevant, reliable and unbiased information possible to be made available for informed decision making at an organisational level regarding climate change, and thus the assurance of GHG emission inventories is key. South Africa has no binding targets under the Kyoto Protocol and no national legislation enforcing the disclosure of GHG inventories. However, this situation may change in the very near future and both assurance organisations and business in general have to start preparing themselves for these changes.

This guideline is a first step in ensuring that accounting and auditing professionals as well as accountants in business better understand climate change, GHG emission measurements and reporting, and the role they can play in this field.

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Published by The South African Institute of Chartered Accountants



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