# Assurance of corporate greenhouse gas disclosures in the mining and crude oil production sector: a comparative international Study

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**Abstract**

*Ecologically sensitive reporting entities increasingly publish separate, non-compulsory sustainability reports as a supplementary source of information to display multiple dimensions of socio-environmental responsiveness. Some of these reports are independently assured by assurers, who may or may not possess any acknowledged credentials. This explanatory work is primarily based on historical records and examines environmental reports relating to assurance of greenhouse gas (GHG) disclosures and carbon governance. An evidenced-based content analysis research method is being utilised to identify the factors associated with variability and unevenness of reporting content against the indicators determined by the ISO 14064 standard. A stronger political-economic infrastructure and the stakeholder-orientated business culture have complementary effects, which collectively influence the demand for selecting a member of the external auditing profession to verify the non-compulsory GHG disclosures. In contrast, companies domiciled and operating within a weaker political-economic environment and currently experiencing shareholder-orientated corporate governance models are primarily driven by the objective of maximising profit and overall shareholders' wealth.*

**Keywords**

Corporate GHG disclosures, independent external assurance provider, ISO 14064 principles, stakeholder-orientated business culture, shareholder-orientated corporate governance model, shareholders' wealth.

## 1. Introduction

Multinational companies (MNCs) worldwide have adopted varying levels of producing greenhouse gas (GHG) disclosures accompanied by assurance statements ranging from simple narrative paragraphs within an entity's annual report to separate, stand-alone sustainability reports as a

supplementary source of information (O'Dwyer & Owen 2005; Kolk, Levy & Pinkse 2008). However, the information remains voluntary because of the absence of any appropriate legislation, regulation and generally accepted verification and validation protocols. Consequently, the current reporting practices adopted by the chosen companies remain inconsistent, incomplete and are not being accompanied by increasing levels of public confidence (Adams & Frost 2007).

Concerns about the importance of managing environmental issues pertaining to anthropogenic climate change are growing with scientific (IPCC 2007), economic (Stern 2009) and political (Gore 2009) arguments emphasising that critical and urgent actions are required. Despite continuous corporate support for different accounting and reporting initiatives, there has been consistent concern that traditional reports do not adequately represent the multiple dimensions of corporate GHG disclosures. The need for different approaches to both acknowledging and taking subsequent actions is beginning to be recognised, even though the rate of progress is exceedingly slow (Patten 2002; Adams 2004).

The specific objective of this study is to determine how strictly companies around the world are complying with the ISO 14064 principles to prepare and present stand-alone GHG emissions reports. Apart from examining the current reporting practice, this paper also highlights another interesting empirical aspect of verifying such information externally through engaging an independent assurance practitioner. A deeper and improved understanding of independent third-party verification is crucial for a number of reasons. Firstly, the information needed to support improved corporate GHG management has received increasing attention over the last two decades because of the introduction of an Emissions Trading Scheme (ETS), the Cleaner Development Mechanism and Joint Implementation Measures (Ratnatunga 2008). Secondly, corporate GHG emissions are now subject to standardised quantitative measurement and are one of the common environmental attributes appearing in the published external reports (WBCSD/WRI 2004; WRI 2009). Thirdly, there are no globally agreed standardised reporting criteria for recording, reporting and projecting levels of GHG emissions and removals in a particular reporting entity. Consequently, the nature and scope of published disclosures are entirely dependent on management discretion. Besides that, the reporting patterns of corporate GHG disclosures are erratic, deregulated, incomplete, and therefore difficult to compare because of the absence of any standardised guidelines, market regulations or even an auditing and assurance standard (Okereke 2007; Jeswani, Wehrmeyer & Mulugetta 2007). Fourthly, there is a lack of specific guidance relating to the assurance of corporate GHG emissions reporting. Consequently, the assurance statements may vary considerably in scope in the standards applied in performing the assurance engagement. Finally, managing and reporting carbon and carbon-equivalent emissions have recently gained significant importance.

Some researchers have questioned the actual or potential benefits of engaging an independent external assurance practitioner. Benefits could include increased stakeholders' confidence in the quality and completeness of reported GHG information and increased stakeholders' confidence in the level of organisational commitments to environmental agendas (including GHG emissions and removals). Moreover, independent assurance is important to improve the credibility of the disclosed information.

It is evident from the literature that assurance statements are typically produced under a strict management brief and are not an outcome of a truly independent enquiry (Gray 2000). According to Deegan, Cooper and Shelly (2006), wide variability of assurance statements both in terms of content and format undermines their contribution. In other words, the credibility of assurance statements is reduced by inconsistent approaches adopted by practitioners to address this issue so that regulation and standardised practices need to be developed and implemented worldwide immediately. Hence, further research to address the importance of assurance engagement of stand-alone GHG document is paramount to increase report users' confidence and perceptions to inform both the international standard-setting process and the development of best practice guidelines.

The paper proceeds as follows. The next section reviews recent concerns with regard to current corporate reporting practices to measure and report GHG emissions data and the selection of an assurance provider to enhance the credibility of such reported information. The relevant theoretical backgrounds are subsequently discussed to develop the research propositions. The following section briefly explains the research method and sample of assurance statements. This is succeeded by the results pertaining to the assurance statements and the current corporate reporting practices to address the GHG-related information. Concluding comments and some recommendations for future research are discussed in the final section.

## 2. Prior literature

Accountants and the accounting literature have begun to acknowledge that environmental issues are subject to intense scrutiny by a wide range of stakeholders and the probability is that the relationship between accounting and the environment will develop further over the coming years (Unerman, Bebbington & O'Dwyer 2007; Hopwood 2009). Jones (2010) suggested that the interaction between the natural environment and human beings has always been complex, but human beings have a responsibility to protect and maintain the global ecosphere. Many companies which have been credited with economic and technological contributions have been severely criticised for creating significant

ecological damage (Hackston & Milne 1996; Bebbington & Gray 2001). An increasing recognition of the impact of human beings on the environment has emerged since the implementation of the Kyoto Protocol.

Enormous pressures have been placed on the corporate sector from a variety of sources to accept responsibility for the detrimental impacts on the environment caused by their principal revenue-producing activities. Management is responsible to account for environmental liabilities associated with their normal business activities (Gray, Kouhy & Lavers 1995; Bebbington, Brown & Frame 2007). Companies are being urged to become accountable to a wider population rather than focussing only on the requirements of shareholders and creditors. Companies, because of their stewardship functions, should accurately report their GHG-related information (Jones 2010). Associated with these massive social pressures, there has been a growing tendency for companies to comply with regulatory bodies' requirements for information related to emissions reduction and ETSs (Bebbington & Larrinaga-Gonzalez 2008; Ratnatunga & Balachandran 2009).

Corporate responses to climate change and global warming have changed significantly over the last two decades. Organisations domiciled and operating in the US were the first to respond to this climate change problem, followed by European companies. Quite surprisingly, European companies have demonstrated a greater willingness to invest in new technologies to mitigate GHG emissions compared with their counterparts located in the US (Kolk, Levy & Pinkse 2008). Soon companies from both the European continent and the US recognised the need for country-level and firm-level participation either to control or ideally minimise this unprecedented global challenge. In particular, a few specific sectors like, mining, petroleum refining, energy, transportation, chemical, and crude oil production began to invest in low-carbon technologies (IPCC 2007; Cook 2009). In the economic context, competitive pressure and the element of interdependence have compelled the organisations to respond to each other's moves. Firms are also obliged to track and report their emissions for managing and assessing climate-related business risks and opportunities due to the powerful presence of environmental pressure groups. Consequently, several initiatives emerged which attempt to leverage the influence of institutional investors to create demand for carbon disclosures; the Carbon Disclosure Project (CDP) is the most prominent and successful example amongst all (Garnaut 2008, Kolk, Levy & Pinkse 2008). The centrepiece of the CDP, an independent, not-for-profit organisation operating on behalf of institutional investors, focuses on carbon emissions and energy usage of individual companies in all industrial sectors. The central theme of CDP is to invite all companies worldwide to report their GHG emissions on behalf of the world's largest institutional investors. Globally, companies are increasingly participating in the CDP to produce carbon disclosure reports. The CDP operates the only global climate change reporting system and holds the largest database

of primary corporate climate change information in the world. CDP has challenged the world's largest companies to measure and report their carbon emissions. In 2009, CDP comprised 534 institutional investors, holding $64 trillion in assets under its management compared to just 35 institutional investors with $4.5 trillion assets' backing in 2003 (CDP 2009). CDP requested GHG emissions and climate change data from more than 5,500 companies located in some 60 countries around the world in the 2009 fiscal year. The result shows that almost 2,500 companies measured and disclosed their GHG emissions, removals and climate change strategies.

There are several theories that explain a company's underlying motivation to disclose GHG information; however, it is not within the scope of this paper to provide a detailed explanation of such theories. The factors include: regulations and standards, impacts and influences of external pressures, greater stakeholders' scrutiny, extent of media attention, and political-economic infrastructure of the company's country of domicile[1].

In examining the selection of assurance providers, this research draws a distinction between companies that choose assurance from specialist consultant assurors (environmental scientists, chemists, engineers) and companies that choose assurance services from the external auditing and assurance profession. As independent external assurance is an expensive process, it is reasonably expected that the companies that have reports assured will receive considerably greater net intangible benefits than the cost of undertaking external assurance. Every rationally minded individual usually seeks assurance services to help improve the credibility of information being used as a basis for decision making. This particular classification is supported by the fact that auditing is a profession with an established history and long-standing reputation that is well-known to various cross-sectional stakeholders (McDaniel, Martin & Maines 2002). These factors collectively help to eliminate possible conflicts of interest and increase public confidence in the competency, independence, legitimacy, ethical requirements, and quality control mechanism of the external auditing profession to ensure quality, completeness and credibility of the reports that are being prepared by their members. The argument is further supported by the fact that enterprises (especially the major audit firms) within the profession also bring a high level of reputation capital to their active assurance engagement. In addition, prestigious accounting firms (KPMG, PriceWaterhouseCoopers, Ernst & Young, Deloitte and BDO) have invested substantial resources in developing and offering a variety of sustainability services. Continuous publicity, active participation and presence through various professional seminars, workshops, conferences, and well-developed websites help to enhance public

[1]Political-economic infrastructure of any country indicate seven dimensions of governance: political stability, voice and accountability, absence of violence/terrorism, government effectiveness, regulatory quality, rule of law and control of corruption (Kaufmann, Kraay & Mastruzzi, 2008)

consciousness. Thus accountants' strong profile as high-quality professional service providers in the field of corporate reporting is likely to provide greater appeal to report users on their ability and expertise to provide a high-quality assurance of GHG documents (O'Dwyer & Owen 2005; Simnett, Nugent & Huggins 2009).

A valid counter argument reaffirms that those specialist consultants who do not have any regular membership of the external auditing profession claim to have a higher level of subject-matter expertise in the assurance of environmental activities. Specialist consultants appear to focus more on completeness, fairness and overall balance in the opinion statements. Consequently, report users may find these statements to be more informative, comprehensive and to provide greater clarity (Hodge, Subramaniam & Stewart 2009). On the other hand, assurance statements issued by practising accountants generally do not include recommendations, appraisal or additional commentary about the organisation's processes and systems. However, the accounting profession has been long recognised as possessing the skills, competencies and market recognition to perform financial statements audits, and these attributes can be transferred to the verification and vouching of non-financial information. Moreover, specialist consultants generally tend to be smaller in size and enjoy limited market capitalisation to gain scale efficiencies. The nature and scope of specialist consultants' work have tended to be narrow and environmentally focused; for example, compliance-type audits with respect to meeting environment regulatory requirements. Furthermore, such specialist, non-professional expertise can always be hired or meaningfully employed by top tier accountancy firms to verify the stand-alone GHG emissions reports (Deegan, Cooper & Shelly 2006; Simnett 2007).

Apart from addressing the current nonfinancial reporting practices, this study focuses on country-specific and industry-specific factors that influence the benefits of undertaking external verification of corporate GHG disclosures. More specifically, this study examines whether the organisational benefits resulting from external assurance are functions of the judicial infrastructure of the company's country of domicile and the industry to which the company belongs. Consistent with the recent accounting literature, it may reasonably be assumed that companies operating in a stronger political-economic environment will be more inclined to legitimise their operations through greater disclosures and are likely to seek external verification to increase reports users' confidence in the credibility of their stand-alone, GHG reports (Deegan, Rankin & Tobin 2002; Simnett, Vanstraelen & Chua 2009). In contrast, the volume of information elected to be disclosed and the demand for assurance is expected to be lower in countries with weaker political-economic environments because of the absence of any country-level protection mechanisms.

## 3. Development of the research propositions

> P1A: Environmentally damaging companies domiciled and operating within strong country-level political-economic infrastructures are more inclined to provide greater information in accordance with prescribed guidelines to prepare and present voluntary GHG disclosures, and will be more likely to have their GHG reports assured by an independent external assurance practitioner.
>
> P1B: Environmentally damaging companies domiciled and operating within weak country-level political-economic infrastructures are reluctant to provide greater information in accordance with prescribed guidelines to prepare and present voluntary GHG disclosures, and will be less likely to have their GHG reports assured by an independent external assurance practitioner.

Aside from the need to increase reports users' confidence, it may be argued that the business culture of any country, particularly if that country is more shareholder-orientated or stakeholder-orientated, can significantly influence the demand and scope for assurance and the selection of assurance practitioners (Bradley et al. 1999; Deegan & Blomquist, 2006). Stakeholder theory is a major driving theory for undertaking this research which has both a prescriptive and a predictive aspect. The prescriptive phase explicitly considers the existence of various cross-sectional stakeholders within the society and how the expectations of any particular stakeholder group may have an impact on corporate environmental strategies. Organisations domiciled in a stakeholder-orientated business culture usually operate under a code-law legal system and experience relatively strong influences on accounting at national and organisational levels. Co-operation and fulfilment of true needs are the cornerstone of stakeholder theory which is based on the notion of humanism and methodological collectivism (Ball, Kothari & Robin 2000).

On the other hand, a shareholder-orientated business culture is one in which companies are primarily considered as instruments for maximising shareholders' wealth. Individual liberty and competition are the central themes of this theory which views the corporation as a collection of explicit and implicit contracts that bind various self-interested and rationally minded shareholders, who are enjoying freedom to bargain with each other within the bounds and norms set by existing contracts. Management is primarily responsible for, and committed to, maximising the return on shareholders' investment, earnings per share (EPS) and overall value (V) of the firm through maximisation of profit (Bradley et al.1999; Garnaut 2008). Fulfilment of socio-environmental responsibilities is not considered an important corporate responsibility.

In the light of the above discussion, two further research propositions can be formally introduced:

P2A: Environmentally sensitive companies domiciled and operating within stakeholder-orientated corporate governance business cultures are more inclined to provide adequate disclosures in accordance with the prescribed guidelines and are more likely to verify their stand-alone, non-compulsory GHG reports by an independent external assurance practitioner.

P2B: Environmentally sensitive companies domiciled and operating within shareholder-orientated corporate governance business cultures are reluctant to provide adequate disclosures in accordance with the prescribed guidelines and are less likely to verify their stand-alone, non-compulsory GHG reports by an independent external assurance practitioner.

## 4. Methods

This study is an extension of the accounting literature which adopts an evidence-based content analysis research method. The new international GHG accounting and verifications ISO 14064 standard prescribed by the International Standardisation Organisation (ISO) in 2006 is considered an important guiding framework for this research. The intention of ISO 14064 is to provide a standardised framework for organisations' environmental policies, plans and actions with respect to GHG emissions and removals. However, ISO 14064 is a voluntary consensus for managing significant environmental aspects which is expected to control and influence corporate environmental responsiveness. The overall aim of this international standard is to support environmental protection and prevention of pollution in order to balance socio-economic needs (WBCSD/WRI 2004; ISO 2007; WRI 2009).

This study investigates the greenhouse gas reports to compare and contrast the information communicated in them. More specifically, this research is strictly confined to the publicly accessible sustainability reports presented by 14 quoted multinational companies belonging to the mining and crude oil production sector operating in eleven different countries worldwide in the 2010 financial year (latest complete year of observation). The major source of these reports is the Corporate Register (http://www.corporateregister.com) which is a comprehensive directory of publicly available corporate socio-environmental reports. This source is supplemented by other multi-disciplinary databases for academic research. An evidence-based content analysis research method is particularly appropriate and the most commonly applicable technique of assessing corporate socio-environmental disclosures (Milne & Adler 1999; Krippendorff 2004; Guthrie & Abeysekera 2006). This method takes into account the ISO 14064 standard for analysing, interpreting, comparing and contrasting the present reporting patterns of the 14 best-known mining and crude oil production companies around the globe.

The companies have been intentionally chosen for this study. Firstly, these are highly visible Global 500 companies from *Fortune* magazine's list belonging to the mining and crude oil production industry. Secondly, these companies are well known and are internationally reputed to be good corporate citizens. Thirdly, these companies have huge assets backing, substantial market capitalisation and receive greater media attention, which collectively encourages them to disclose more information in their stand-alone sustainability summary reports. Fourthly, most of them have received awards and other recognition in recent times for the reporting of non-financial performance. Last but not least, none of them has prepared and presented a separate, stand-alone GHG emissions report in accordance with the ISO 14064 principles. Given these common characteristics, it may be meaningfully expected that there will be a greater element of comparability and consistency between and amongst the companies. This would be particularly true for those companies operating in the same industry, inasmuch as they face similar opportunities and challenges to present their socio-environmental disclosures.

A 1/0 binary coding has been assigned for each indicator[2]. This method is technically known as codifying the content of corporate GHG disclosures into a quantitative scale (Frost et al. 2005). This study acknowledges that the company has addressed some information regarding the relevant issues prescribed by the ISO 14064. It is, however, worth remembering that ISO standards are not governed or enforceable by any environmental laws and do not regulate the environmental activities. Adherence to these standards is purely voluntary and subject to management discretion of any ecologically exposed reporting entity.

The initial stage of the analytical process involves comprehensively reading and analysing the reports. Empirical literature available on GHG disclosure is limited, largely because the current corporate reporting practices to disclose GHG related information are still in the early stage of development. This study utilises the existing literature on sustainability reporting, since GHG disclosure is one particular aspect of the entire reporting process designed to provide managerial information that will assist companies facing short-term and long-term decisions about GHG emissions issues in a world where corporate activities are strongly implicated in the related ecological crisis. For each company, the 2010 sustainability reports were collected and investigated. The data analysis on corporate GHG emissions and removals was undertaken between 24

[2]One "1" refers to the present reporting practices about corporate environmental activities including GHG emissions and removals which comply with the prescribed guidelines as per ISO 14064. This reporting practice has positive, beneficial and comprehensive impacts on corporate citizenship due to fulfilling the prescribed reporting criteria. On the other hand, zero "0" refers to the present reporting practices about corporate environmental activities, exerting negative, harmful and inadequate effects on corporate citizenship due to non-fulfilment of the prescribed reporting criteria.

August and 30 September 2011. Analysis of the disclosures for each company was undertaken independently by two researchers. Discrepancies between the researchers were identified and logged. A third researcher then adjudicated on any discrepancies from the initial analysis. The primary aim of involving multiple coders is to assess the reliability of coding performance against the predetermined indicators set by ISO 14064. Weber (1988, acknowledged in Milne & Adler 1999, p.238) defined this concept as inter-rater or reproducibility reliability. The evidence was continually evaluated, analysed and updated in order to refine the concepts and to ensure the quality of data with an expectation to avoid the anachronism problem (Neuman 2006). Finally, evidence and arguments were arranged to communicate a coherent and convincing research report in the following section.

Consistent with Schaltegger and Burritt (2000) and Simnett, Vanstraelen and Chua (2009) the principal revenue-generating operations undertaken by the mining and crude oil production sector are commonly regarded as some of the most environmentally damaging. The industry extracts non-renewable resources with major environmental consequences. Depletion of mineral resources should be adequately compensated for by the creation of new streams of wealth which can benefit present and future generations (Deegan & Rankin 1997). Consistent with stakeholder theory, procurement of a licence is an essential prerequisite for accessing scarce resources and gaining, as well as retaining, sustainable competitive advantage over other contemporary organisations, which are conducting their operations under the same conditions. Organisations do not possess any inherent rights, rather, the right to access such limited, economically useful resources must be earned through some socially acceptable organisational performance. Stakeholders are primarily responsible for, and play an important role in, granting a community licence to an organisation subject to fulfilment of various non-financial expectations. Stakeholders are also responsible for identifying problems and developing efficient and effective solutions. The products of mining and crude oil industries are some of the main sources of atmospheric emissions on a global scale and contribute substantially to overall GHG emissions. Consequently, key stakeholders are extremely interested in inspecting the operating activities of these environmentally sensitive companies.

## 5. Findings

The research identified two major groups of GHG reporting performance. Companies in Group-I have an exceptional standard and quality of reporting. They cover almost every aspect of the ISO 14064 standards, providing consistent depth in terms of quality and uniformity of reporting. This group is termed as “Differentiators” which comprises of five leading companies. Group-II contains the remaining nine companies which exhibit an excellent standard of reporting in specific categories, but lack

consistency across all areas and produce somewhat inconsistent information. This group is categorised as "Fast Learners".

## 5.1 Differentiators

The five leading companies demonstrated an extraordinarily high standard of reporting across all prescribed areas. These companies as listed in Table 1 strictly comply with the ISO 14064 principles to differentiate their reporting patterns with their existing and potential stakeholders. This helps to access future resources from local, national and international levels. Quite interestingly, these resources do not necessarily comprise nor are limited to minerals under the ground, but also include efficient employees, advanced technology, latest equipment, performance, market capitalisation, access to external finance, and positive community support to continue their extracting operations for an indefinite period of time. Companies belonging to this group have been actively engaged in managing carbon emissions beyond the prescribed legal standards. Reducing GHG emissions intensity is treated as a key performance indicator and these companies aim to improve the energy intensity of all their operations.

**Table 1: Content analysis of the 14 publicly available reports (2010) selected for this research**

| S N | Company [Country] | Global Rank | Report | ISO 14064 Indicators | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| 01 | Pemex [Mexico] | 031 | Social Responsibility Report | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 02 | BHP Billiton [Australia] | 120 | Sustainability Summary Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 03 | Rio Tinto Group [Britain] | 134 | Annual Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 04 | Nippon Mining Holdings [Japan] | 203 | Sustainability Report | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05 | Cvrd [Brazil] | 205 | Sustainability Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06 | Encana [Canada] | 284 | Corporate Responsibility Report | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07 | Alcoa Inc. [USA] | 314 | Environment, Health & Safety Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 08 | China National Offshore Oil [China] | 318 | Sustainability Report | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 09 | Xstrata [Switzerland] | 320 | Sustainability report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Anglo American [Britain] | 336 | Sustainable Development Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 11 | Occidental Petroleum [USA] | 365 | Social Responsibility Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 12 | Husky Energy [Canada] | 396 | Sustainable Development Report | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 13 | Oil & Natural Gas Corporation [India] | 402 | Health, Safety and Environmental Report | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 14 | Surgutneftegas [Russia]* | 420 | Sustainability Report | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |

*Information is missing from the table because of the unavailability of necessary data for the 2010 fiscal year.

All five companies have been enjoying leadership in the mining and crude oil production sector for many years. All five companies are committed to surpassing the established standards of excellence in Research & Development (R&D), GHG emissions reductions initiatives, project implementation and business operations. All five companies are included in Fortune magazine's (2009-10) list as the world's most renowned companies in the mining and crude oil production sector (Perez & Sanchez 2009; Fonseca 2010). As a result, these companies have significant financial and geographic impact, adequate asset backing and a long-standing reputation to prepare and present comprehensive reports with an objective to exhibit multiple dimensions of socio-environmental responsiveness. All five companies have reported the six different compositions of GHG emissions in carbon dioxide ($CO_2$) equivalent over the last three fiscal years.

$CO_2$ is the predominant component of BHP Billiton's and Occidental Petroleum's GHG emissions and the remainder is methane ($CH_4$). Emissions of other GHGs are insignificant from a reporting perspective. Both companies have taken reasonable initiatives to convert the materially significant GHG components into carbon and carbon-equivalent emissions on the basis of their global-warming potential. It is, however, worth mentioning that methane has 21 times higher global warming potential than that of carbon dioxide. $CO_2$ is the major component of Alcoa's GHG emissions followed by perfluorocarbons. It is evident from the reports that all of them have installed system administrators to account for the volume of gas emitted into the atmosphere with sufficient detail and accuracy. Different sources of indirect emissions (such as Scope 2 emissions) associated with electricity purchases from off-site suppliers are also being disclosed appropriately (IPCC 2007).

Occidental Petroleum has consistently ranked amongst the safest companies in the US for fourteen consecutive years. Alcoa has been a leader in reducing GHG emissions from its operations for nearly two decades. These companies are working proactively with climate change legislators to ensure that the significant benefits of their extracting operations play a key role in the climate change solutions (Corporate Register 2010).

Rio Tinto displays substantial growth in expenditures on applied environmental controls. A number of initiatives and investments have been taken into consideration to improve the efficiency and environmental standards of Rio Tinto mining operations. An emergency response system for oil leaks has also been developed and is technically termed as *mobile environmental ambulance*. Planned activities, including modernisation and improvements of construction as well as installation of monitoring equipment, have been included within the Anglo American's agenda. Several projects are aimed to reduce the amount of oil used to reduce the

risk of oil leaks, oil spills in accordance with the ISO 14000 environmental management systems (Corporate Register 2010).

The Australian Government enacted section 299(1)(f) of the *Corporations Act* in 1998, reissued in 2002. This is a federal government initiative to encourage better and more transparent reporting (Frost 2007; Lipton, Herzberg & Welsh 2010). The inclusion of *Energy Efficiency Opportunities (EEO) Act* in 2006 is another important Australian Government initiative to improve the identification and evaluation of energy efficiency opportunities by large scale energy users. Every Australian organisation is required to fulfil the legislative criteria irrespective of its primary line of operations. Directors of Australian companies are required to submit detailed performance reports if a company's operations are subject to any particular and significant environmental regulation.

BHP Billiton's environmental practices are based around optimal usage of resources (water, energy) with a focus on reuse, reduction and mitigation of environmental impacts. It is expected that the application of EEO program governed by the *EEO Act 2006* will contribute to BHP Billiton's strategy for meeting the energy intensity target on a global basis. In 2009, the company experienced a five per cent increment in the GHG emissions intensity index for the company's global sites. This was largely because of the switching of fuels used by third-party electricity generators that serve the company's operations. The company's overall strategy is to achieve GHG intensity targets including improving energy efficiency and investigating cost effective alternative energy sources. BHP Billiton and its technology provider MEGTEC System were the first to develop plant at a cost of A$30 million which is capable of generating six megawatts of electricity per hour. This plant will reduce the company's GHG emissions by 250,000 tonnes of $CO_2$ equivalent per annum. The company is constantly seeking the highest standard of return on shareholder's investment along with world-class performance in sustainability and carbon and carbon-equivalent management.

In response to increasing stakeholder pressures, CEOs of large mining companies launched the Global Mining Initiative (GMI), one of the most comprehensive sustainability-orientated efforts ever seen in that sector. All five companies are active members of the GMI with an intention to move forward their present reporting practice up to the next level (Young 2005; Jenkins & Yakovleva 2006; Fonseca 2010). They have admitted that climate change is a defining challenge and there is an urgent need to take meaningful action towards addressing its multidimensional causes. Most importantly, all operations are externally audited against the ISO standards. Audit results reveal that, whilst some operations are fully compliant with the prescribed standards, others are still working to improve their present performance level. This is the most interesting point which clearly re-affirms an association between the choice of an assurance

provider and the stronger political-economic atmosphere of a company's country of domicile. Organisations operating in stronger political-economic frameworks have a greater incentive to provide more positive perspectives of their activities to re-establish their legitimacy and justify their existence. Hence, the results provide strong support for propositions P1A and little support for P2B.

It may be concluded that despite the presence of two contrasting features: a shareholder-orientated corporate governance model and strong political-economic environment, the latter component has a more prominent influence over non-financial disclosures and in selecting an independent external assurance practitioner to verify non-compulsory GHG documents.

## 5.2 Fast Learners

The remaining companies belonging to this group as listed in the Table 1 are currently passing through the "strategic transition phase". They are rapidly improving their current reporting performance and striving to adapt the leading practices displayed by Differentiators. These companies are not only complying with the prescribed legal guidelines from a reporting perspective, but also addressing a broad range of environmental programs purely from a risk minimising and cost leadership point of view. These companies have outstanding reporting practices in specific categories but fail to achieve consistency across all aspects as recommended by the ISO 14064. These companies have shown strong willingness to adopt the reporting styles and patterns demonstrated by the differentiators.

Analysis and interpretation of their non-financial reports clearly reveals that there are plenty of opportunities for further improvement. Companies are committed to continuous advancement in building an environmentally appropriate business model. Fast Learners are striving to reduce emissions as far as possible by using advanced technologies to keep their emission levels within the prescribed limits as per national and regional requirements. Companies are trying to manage their operations with openness, effectiveness and accountability. Companies are doing their best to choose modern, effective and environmentally efficient technologies whilst making a sound assessment of their environmental responsiveness. The proper balance between environment and economy is also being taken care of at the time of making major investment decisions. Companies are investing significantly in R&D activities to improve energy efficiency in their regular operations, especially in renewable and low emissions energy sources.

Husky Energy, Xstrata, CVRD, and Nippon Mining Holdings have a structured and systematic approach to take environmental aspects into account, including setting requirements and targets as well as performing follow-ups. Health, safety, welfare, and sustainable development have been given first priority in the companies' agenda. Environmental effects

of their activities are kept to a minimum and all of them are striving to make sure that local communities can exploit benefits as much as possible from their regular extracting operations. Companies handle these factors as an integral part of the business management. Social, environmental and ethical performances are also being taken into account when selecting suppliers, contractors and partners.

Training is an important foundation for raising awareness in any environmental work. Most of the companies have developed on-line safety orientation programs for their staff. This particular initiative will enable the employees and contractors to receive the relevant information relating to health and safety, prior to arriving at the work place. Most of them are striving to provide electronic learning facilities to all employees. Environmental issues are included in management training programs with an intention to share knowledge and know-how amongst the participants who are actively involved in the extracting operations.

Husky's on-line safety orientation program has been recognised with two world-class awards in 2010. Xstrata implement regular training programmes to raise employees' awareness about environmental issues and educate relevant personnel about the environmental risks and opportunities specific to their sites. The company's management regularly sponsors research and brings in environmental experts to provide specialist advice. CVRD has invested significant resources to develop its own corporate guidelines to establish a carbon management program in 2009. This program will help to improve the quality of its GHG inventory. More importantly, the company consumes (89%) hydroelectric power to carry out its regular extracting operations with an expectation to preserve the non-renewable resources.

Only Pemex, Nippon Mining Holdings, Xstrata, CVRD, and Husky Energy are actively engaged in the Global Investment Community and their operations are aligned with the International Council on Mining and Metals sustainable development principles. Pemex and Husky Energy are the only two companies in this group to have taken reasonable initiatives to verify their reports externally. This particular finding provides strong supports for propositions P1A, P2A and little support for P2B. The reporting structure and assurance section for third-party assurance information of the remaining companies reveal the active participation of managers and employees in the reporting process through structured communication activities. These activities have supported the establishment of an internal culture with the relevant ISO principles being a performance reference in their internal verification practices and internal management decision making. The companies' environmental management systems are strictly aligned with the ISO 14000 principles. The reports produced by the remaining companies are not verified by any independent assurance practitioner and management do not rely on external ISO certification as an indicator of environmental performance.

These companies operate their own rigorous sustainable development assurance program.

This is the most striking feature which clearly re-states an association between the choice of an independent external assurance provider and the stronger political-economic infrastructure of a company's country of domicile. Hence, the research findings confirm that the demand for assurance is higher amongst companies belonging to the mining and crude oil production industry. It is also evident from the analyses based on current reporting practice that companies domiciled and operating in weaker political-economic environments are rather inclined to seek assurance of voluntarily published GHG reports from internal assurers (specialist consultants) who may or may not possess any approved training, qualifications and expertise with respect to verification of non-financial performance documents.

## 6. Discussion

The results presented in the preceding section generally support the propositions being developed that the incidence of assurance of non-compulsory GHG reports is higher amongst companies belonging to the highly visible industrial activities with larger carbon footprints. The first four indicators prescribed by the ISO 14064 (as mentioned in the Table 2) are purely procedural. In the absence of any specific information, it has been reasonably assumed that every chosen company has adequately complied with these guidelines for preparation of a non-compulsory GHG document. The mining and crude oil production sector started producing separate environmental reports in the 1990s, after which the reporting practice gradually gathered momentum, and now the industry enjoys a leadership position in GHG disclosures. However, the fact remains that there are considerable elements of variation in the maturity of reporting content and styles amongst the top fourteen chosen MNCs (Young 2005; Jenkins & Yakovleva 2006). Analysis and interpretation of the fourteen non-financial reports clearly reveals that none of them has prepared a stand-alone statement intended to communicate GHG-related information to its target users. Findings provide added strength to the arguments for the need to improve current corporate practice pertaining to the assurance of GHG disclosures and the development of globally agreed standards for preparation and presentation of such reported information.

In the last two decades, the accounting literature has witnessed a significant amount of research to address corporate environmental responsibilities. However, most research in this area has been incomplete and simplistic (Schaltegger & Burritt 2000). Leading researchers have commented that the whole process of environmental (including GHG emissions and removals) auditing is incomplete and vague because of the absence of any globally agreed reporting framework and measurement

criteria. In most instances, researchers are still in the dark with their investigations concerning the content of information elected to be disclosed, how to disclose the materially significant information meaningfully and convincingly and how to compare and evaluate business viability on environmental grounds.

**Table 2: Indicators prescribed by the ISO 14064**

| Code | Description (summary) |
|---|---|
| A | Description of the reporting organisation |
| B | Person responsible |
| C | Reporting period covered |
| D | Documentation of organisational boundary |
| E | **Direct** GHG emissions, quantified separately for **each** GHG, in tons of $CO_2$ equivalent |
| F | A description of how $CO_2$ emissions from the combustion of biomass are treated in the GHG inventory. |
| G | GHG removals quantified in tons of $CO_2$ equivalent. |
| H | Explanation for the exclusion of any GHG sources or sinks from the quantification. |
| I | Energy **indirect** GHG emissions associated with the generation of imported electricity, heat or steam, quantified separately in tons of $CO_2$ **equivalent**. |
| J | The historical base year selected and the base-year GHG inventory. |
| K | Explanation of any change to the base year or other historical GHG data, and any recalculation of the base year or other historical GHG inventory. |
| L | Reference to or description of, quantification methodologies including reasons for their selection. |
| M | Explanation of any change to quantification methodologies previously used. |
| N | Reference to, or documentation of, GHG emissions or removals factors used. |
| O | Description of the impact of uncertainties on the accuracy of the GHG emissions and removals data. |
| P | A statement that the GHG report has been prepared in accordance with this part of ISO 14064. |
| Q | A statement describing whether the GHG inventory, report or assertion has been verified, including the type of verification and level of assurance achieved. |

The first four indicators prescribed by the ISO 14064 are procedural. In the absence of any specific information in stand-alone sustainability reports, it has been reasonably assumed that every company selected in this research has adequately complied with these guidelines for preparation and presentation of non-compulsory GHG disclosures.

*Information is missing from the table because of the unavailability of necessary data for the 2010 fiscal year.

Researchers and professionals are striving to incorporate every aspect according to the latest version of ISO 14064 standard with a view to presenting information comprehensively. Moreover, no commonly accepted accounting techniques, analytical tools or statistical methods are available to report, review and objectively evaluate the corporate environmental responsiveness. Additionally, there are no proper guidelines and standards available that adequately cover the environmental audit process including GHG emissions and removals. Consequently, researchers have tended to use their own measurement criteria rather than using the pre-existing definitions, concepts, techniques and tools provided by the regulatory bodies. This is not only hampering the comparisons and analyses, but also limiting the desired progress. This finding is consistent with Burritt, Hahn and Schaltegger's (2002) conclusion that despite the presence of very stringent market regulations, collections of environmental information (including GHG emissions and removals) remain unsystematic and poorly co-ordinated from an international context.

The findings are consistent with the comment made by Burritt, Schaltegger and Zvezdov (2011), that environmental regulations with regard to corporate GHG emissions are becoming increasingly stringent worldwide. Many countries and a few specific industries are facing stricter regulations, which mean companies need to address the issue in their external reports. Current corporate reporting practice and the critical review of literature clearly indicate that some companies are trying to comply only with legal requirements to avoid fines, penalties or loss of licence in order to continue their operations. On the other hand, a few leading companies have been actively engaged in managing carbon emissions beyond the prescribed legal level of compliance, with a view to obtaining a sustainable competitive advantage in the long run.

Efforts have been devoted to improving the content and structure of external reports and making them concise, quantitative, cost-effective, performance-orientated, and comparable (Simnett, Nugent & Huggins 2009). Consistent with compulsorily announced mainstream financial reports, there are different motives for preparing and presenting GHG disclosures. Firstly, every organisation has social and moral obligations to engage in environmentally responsible activities because of ethical corporate practice. Secondly, corporate environmental disclosures have risen substantially over the last two decades because of the existence of environmental pressure groups (Tilt 1994). Consequently, environmental information has increasingly become economically relevant for decision making and corporate responsibility. Thirdly, scientific findings illustrate that the impacts of collective human actions on the natural environment are not only local, national or regional but also pose a threat to the global ecosphere (Maunders & Burritt 1991; Schaltegger & Burritt 2000). Fourthly, comprehensive disclosures relating to GHG emissions create a better and more persistent corporate reputation and help to enhance a corporate credibility that will eventually create shareholders' wealth via

increased net operating profits. Finally, "watchdog groups" pay regular attention to the extracting operations of mining and crude oil production sector worldwide. Hence, it is no longer possible to expect that less stringent environmental restrictions in a survival economy are the valid excuse to avoid the standards imposed by environmental pressure groups (Gray, Owen & Adams 1996). However, despite continuous corporate support, significant disparities prevail between the perceived norms and ethics expected by a wide range of stakeholders and the published GHG disclosures due to regulatory uncertainty and the absence of any commonly agreed standardised guidelines.

Consistent with the literature, the findings clearly reveal that corporate GHG disclosures vary significantly because of several of the following country-specific characteristics: country of origin, prevailing legal infrastructure of the company's country of domicile, corporate governance business culture, greater exposure to stakeholder scrutiny, and the severity of socio-environmental problems or other external events (Adams 2002). In addition to this, availability of resources, companies' profit earning capacity, size and volume of the company, the extent of media attention, volume of assets backing, and substantial market capitalisation also have noticeable impacts on the current reporting practice. One of the greatest challenges in assessing the value that is being added by the published reports is the extraordinary amount of variation and the considerable level of unevenness in the form, style and content of GHG disclosures.

The results support the comment made by Guthrie and Parker (1989) that corporate non-financial reports cannot be considered a neutral and representationally faithful document because of the presence of various suggestions and guidelines prescribed by different professional accounting bodies worldwide. However, stand-alone GHG emission reports can be considered a product of the interchange between the corporation and its environment and society at the broadest level, and an attempt to facilitate and accommodate conflicting non-financial interests of diverse cross-sectional stakeholders.

Many companies are still working with company-specific provincial and federal regulators on the development of GHG-related information and climate change regulations whilst supporting the climate change action plan. In the absence of national and international agreements, many provinces in the European Union, Canada, Australia, and the northern US have developed individual climate change regulations. It is evident from this research that companies domiciled and operating in stronger political-economic environments and stakeholder-orientated corporate governance business cultures are inclined to provide greater disclosures in the stand-alone environmental reports in accordance with the prescribed guidelines and are more likely to seek assurance of the non-compulsory GHG disclosures from an external, independent assurance practitioner.

Several difficulties in data gathering need to be acknowledged. The selected companies prefer to avoid additional compliance costs associated with the production of a stand-alone GHG emissions report. This leaves limited common ground for undertaking meaningful comparison. Different reporting practices are adopted by companies registered under the legislation of developing countries (such as Africa, South America and Asia) that are currently passing through a transitional economy, where local communities often face the impacts of socio-environmental costs without necessarily gaining any materially significant benefits. Local populations view a mine as an economic boost which is capable of creating future employment thereby minimising or ideally eliminating poverty. The populace is less concerned with potentially polluting activities so long as they have a source to earn a living. Moreover, companies located in these regions are not inclined to develop a compliance mentality; rather they prefer to follow the traditional approach. Consequently, separate, stand-alone GHG emissions reports are not readily available to assist constructive managerial decision making.

Another contributory factor towards the formation of stand-alone GHG emissions reports within the mining industry is the amalgamation of companies domiciled and operating in two different countries. A cross-border merger of two mining companies contributes to more sophisticated and comprehensive reporting style, for example Billiton from South Africa merged with BHP from Australia in 2000 financial year. The new merged company's (BHP-Billiton) disclosure policies are likely to be heavily influenced by the stronger reporter, in this case BHP.

## 7. Concluding comments

This study aims to develop an understanding of the international market for assurance services provided on stand-alone, non-compulsory GHG emissions reports and the selection of assurance practitioners. This research uses an evidenced based content analysis to (1) provide background information on the factors associated with the decision to produce these comprehensive reports, (2) the factors associated with the independent verification of such information, and (3) factors associated with the selection of assurance practitioners. Analyses and interpretation reveal a general trend towards increasing sophistication of the medium of reporting and content of information elected to be disclosed in the published external reports. Moreover, the nature and scope of GHG emissions and removals have been generally qualitative and favourable to the company concerned (Jenkins & Yakovleva 2006; Lodhia & Martin 2012). Consequently, the elements of subjectivity which leave room for personal judgment and opinion to influence the reporting style persist. As a result of such ambiguity, corporate GHG disclosures remain a part of additional explanatory notes and fail to warrant any place in the mainstream statement. Furthermore, the prevailing styles, formats, content

and standards of reporting vary greatly across the fourteen MNCs because of the presence of cross-country variation. Findings reveal that there is no separate, independent GHG emissions report in accordance with the ISO 14064. Information relating to GHG emissions and removals has been merged with the stand-alone sustainable development reports as a part of their broader environmental responsiveness. The elements of discrepancy and deregulated reporting practices indirectly allow the companies to be broadly clustered into two different categories, as discussed in the preceding section.

The last two decades since the implementation of the Kyoto protocol in 1997 have witnessed a significant development of corporate environmental responsiveness especially related to GHG disclosures. Corporate environmental responsibility is increasingly becoming instrumental for ecologically sensitive reporting entities. Amongst the various initiatives that a modern company should adopt to assume this responsibility, its position concerning climate change should be highlighted. The environmental responsibility should be towards controlling or reducing GHG emissions and also contributing toward the reduction of vulnerabilities, not only at the national level but also on a global scale. Climate change is a relatively new and unprecedented global challenge to which government, political parties, corporate sectors, not-for-profit organisations and individual citizens are called to respond within the scope of their respective duties and responsibilities.

This research has theoretical, practical and policy level implications. At a theoretical level, it adds to the limited but emerging literature on corporate GHG accounting and reporting. In relation to practice and policy, this project has several implications. Firstly, assurance service providers, particularly specialist consultants, may need to review their profile and credentials carefully in the market prior to accepting any assurance engagement. Likewise, client organisations seeking an assurance practitioner would also need to devote greater attention to select the type of service provider. With the growing number of independent third-parties other than top tier accounting firms within the profession currently providing assurance service of non-financial performance reports (including GHG emissions and removals); this issue is becoming increasingly important.

Secondly, stakeholder theory does not specifically mention the definition and scope of the intended population or target audience to whom the report should be made available. Given the lack of defined user groups for the report, it remains difficult to make clear decisions about what information should be included, what should be the minimum reasonable length and depth of such information and how to prepare and present such information in order to address various non-financial stakeholders' expectations. Hence, the definition and scope of relevant stakeholders

need to be refined and clearly identified in order to minimise ambiguity and improve generalisability of the reported information.

Thirdly, the benefits of production and independent verification of stand-alone GHG emissions report are not clearly defined. Although prior research has examined some of the motivating factors that drive an enterprise to produce a separate document, there is a scarcity of empirical evidence that inspects the underlying motivations to provide assurance with these reports. Examination of these ranges of issues is likely to lead to the identification of factors that would improve the quality and usefulness of GHG reports. It is evident from the literature that approaches adopted by accountants and consultant assurance practitioners are often very different. An examination of these different approaches to assurance and how they add value to stakeholder expectations would be a valuable contribution to the future development of assurance practices with respect to GHG emissions and removals.

Fourthly, every environmentally exposed reporting entity is accountable to release a separate stand-alone GHG document along with economic, environmental and social information. Accounting can play a number of potentially important roles in helping to address and resolve these urgent issues and thus could help to make the world more environmentally sustainable. For reporting practice to be more effective and efficient, it would require fundamental shifts in a number of accounting principles and policies and in the underlying assumptions and premises upon which analyses and interpretations are based. Environmental accounting is only perceived as an important technique if it is capable of enhancing the overall value of any reporting entity. Even though the generally accepted carbon accounting and assurance standards have yet to be developed and implemented from an international standard-setting perspective, the progress and collaboration in this direction is worth considering. Prescribing a commonly accepted standard would be one of the most important and influential contributions accounting could make to the business world. The accounting profession must play its part in correcting the greatest and arguably one of the widest ranging market failures ever faced by the world, namely the need for prescribing globally agreed carbon emissions regulations and legislations.

These conclusions must be moderated by the following considerations. The limited selection of industries, companies and countries implies that the results are industry specific and not necessarily applicable to other organisations that have completely different lines of operations and belong to different industries altogether. Such choices will certainly impact on the results, which are undertaken from a macro perspective utilising the available aggregated resources. Furthermore, it is important to clarify that many companies belonging to the mining sector do not produce relevant external reports and are screened out. More specifically, smaller companies are less likely to appear on the type of database used in this

research to provide additional non-financial performance information, primarily because of the resource constraints. Hence, they are automatically excluded from this analysis.

In summary, separate, stand-alone GHG emissions reporting is only considered to be meaningful if such reports are perceived as being relevant and credible. The provision of assurance can assist ecologically sensitive organisations in achieving this objective worldwide. This research supports the need for prescribing one commonly accepted standardised guideline for corporate GHG disclosures and independent third-party verification of such reported information. The growing availability of data, even with their limitations, provides opportunities for more in-depth investigations of corporate responses to anthropogenic climate change and carbon accounting and reporting. Nevertheless, future research on the assurance of GHG disclosures is tremendously important for the effectiveness of these reports. Accounting researchers can play an important role in helping to put things in the right perspective.

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