

# Standardized reporting of climate change information in Australia<sup>1</sup>

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## **ABSTRACT:**

**Purpose:** This paper explores the gaps between (1) regulatory requirements and authoritative guidance regarding climate disclosure in Australia, (2) reporting practices, and (3) the demands for increased disclosure and standardization of that disclosure.

**Approach:** The Draft Reporting Framework of the Climate Disclosure Standards Board (CDSB) is used to develop a scoring system, against which the climate disclosures of one large Australian company that has received awards for its disclosure record are assessed. Relevant theories of voluntary disclosure are used to explain the findings.

**Findings:** The results of this analysis indicate an inadequate amount of disclosure in this company's reports about some aspects of climate change impacts and their management. Further, the disclosures that are made tend to lack technical detail and are somewhat skewed towards the more positive aspects of climate change impacts and management.

**Research limitations:** These findings are based on just one large Australian company that has received commendations for its climate disclosure record, and may therefore not reflect the climate disclosure practices of other Australian companies.

**Practical implications:** The results of this case study appear to support calls for increased guidelines for the disclosure of climate change related information and greater standardization of reporting. Several potential policy options for doing this are assessed.

**Originality/value:** This study uses an objective measure to assess climate change disclosures which was developed for this research. The results are expected to be useful for informing the continuing debate around the regulation of and/or provision of guidance to Australian companies about the disclosure of climate change related information.

**Key words:** climate, disclosure, reporting framework, standardization, Australia

**Categorization:** Case study

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## 1. Introduction

This paper explores the gaps between (a) regulatory requirements and authoritative guidance regarding climate disclosure in Australia, (b) reporting practices in this area, and (c) the demands for increased disclosure and standardization of that disclosure. Climate change disclosures include:

- those about greenhouse gas (GHG) emissions intensity and energy use,
- participation in emissions trading schemes,
- corporate governance and strategy in relation to climate change,
- performance against GHG emissions reduction targets, and
- risks and opportunities related to the impacts of climate change.

These impacts include the contribution of the company to climate change (through GHG emissions), climate change cost increases through emissions trading or other regulations, and the physical effects of climate change such as variable weather, uncertain access to water and extreme weather events.

There are limited regulatory requirements for Australian companies to disclose climate change related information in annual or sustainability reports. While National Greenhouse and Energy Reporting (NGER) reporting requires some Australian corporations to report their GHG emissions, energy production and consumption, and related information to the Department of Climate Change and Energy Efficiency, this information is not required to be disclosed in the companies' annual or sustainability reports. Further, the Corporations Act 2001 and the Australian Stock Exchange (ASX) Guidance Note 10: Review of Operations and Activities require disclosures about corporate risks and opportunities, their management, and key non-financial performance indicators; however, neither of these requirements specifically mentions climate change. Some Australian companies are voluntarily making some climate disclosures in sustainability and other corporate reports. However, others are not, and there is substantial variation in the amount, type, presentation, and ultimately the usefulness of these disclosures.

We contribute to the literature on climate change disclosure and its regulation by documenting the gap between regulatory requirements and authoritative guidance regarding climate disclosure in Australia and the demands for increased disclosure and standardization of that disclosure. This part of the research includes a discussion of the emergence of several voluntary reporting frameworks that have the potential to play a role in reducing this gap. In particular, we review the Global

Reporting Initiative (GRI) G3 Guidelines, the Carbon Disclosure Project (CDP) questionnaire and the Climate Disclosure Standards Board's (CDSB) Climate Change Reporting Framework as they relate to the disclosure of information about climate change. We also contribute towards policy debate in this area by assessing several potential policy solutions.

Further, we evaluate the climate change disclosures of an Australian company that has received commendations for its climate disclosure record. This evaluation is made against (1) a comprehensive evaluation tool based on the CDSB's draft reporting framework developed for the purposes of this research, (2) several other less comprehensive and/or standardized reporting schemes (NGER, GRI and CDP), (3) existing Australian regulations and authoritative guidance, and (4) relevant theories of voluntary disclosure. The company that we choose for this analysis has recently received a sustainability award which acknowledges its strategic response to climate change and disclosure record in relation to GHG emissions. Further, its response to the CDP 2009 questionnaire was ranked third in the world for its sector. Arguably it could be considered as an example of best practice climate change reporting in Australia. This company has been operating in the energy industry for over ten years and has a large customer base. It has a diverse power generation portfolio including base, peaking and intermediate electricity production plants. These are spread across traditional energy sources, e.g. gas and coal, as well as renewable sources, including hydro, wind, landfill gas and biogas.

Our results indicate that our case study company provides comprehensive and informative responses to both the GRI G3 Guidelines related to climate change and the CDP questionnaire, and that its sustainability report disclosures include information required for NGER. However it does not seem to place great emphasis on compliance with ASX Guidance Note 10, nor does it score well when its sustainability report disclosures are assessed relative to our comprehensive evaluation tool. Several theories in the area of voluntary disclosure are used to shed light on these results. This evaluation contributes to the literature on climate change disclosure and its regulation by providing an insight into how well current best practice in Australia can be explained by theories of voluntary disclosure, and the extent to which it is influenced by key mandatory and voluntary reporting frameworks. Our results also have the potential to contribute towards practice in this area by highlighting the strengths and weaknesses of the case study company's reporting practices.

The next section of the paper reviews the prior literature and relevant theories, while

the following section describes current Australian regulations and voluntary reporting frameworks. The climate disclosures for the case study company are then evaluated against relevant theories and benchmarks including an evaluation tool based on the Climate Disclosure Standards Board (CDSB) draft reporting framework. Policy options are discussed in the final section.

## **2. Prior literature and theoretical perspectives**

Several recent studies have investigated various aspects of climate change disclosures. Disclosure of climate change risks and opportunities is the topic of two recent studies (Doran and Quinn 2009, CERES 2009). Doran and Quinn (2009) analyse the climate change related risk disclosure trends in Standards & Poor's 500 (S&P 500) from 2000 to 2008. They show that despite management knowledge about the risk created by climate change and its physical and financial impacts, about 76.3% do not report these risks in their annual filings. Similarly, CERES (2009) find that the majority of their sample of 100 global companies do not disclose any GHG or climate change risk information in 2008, and the quality of information reported was at best 'fair'.

Freedman and Jaggi (2005) and Prado-Lorenzo et al. (2009) investigate several factors related to a broader group of annual and sustainability report disclosures of GHGs emissions and the effect of climate change on corporations. Prado-Lorenzo et al (2009) find positive associations with company size and market capitalization and a negative association with profitability. Several authors have investigated the determinants of corporate responses to the CDP questionnaire and the extent and type of information included in these responses. Stanny and Ely (2008) find that the propensity to respond to the CDP questionnaire is related to company size, previous disclosures and foreign sales. Peters and Romi (2009) find that the level of disclosure in CDP responses is related to the environmental regulatory stringency of the government, the environmental responsiveness of the private sector, and the market structure of each country.

Several theories have been developed to explain voluntary corporate disclosures, and a sub-set of these have the potential to explain climate change disclosure behaviour. These include both socio-political theories and economics based theories (Patten 2002; Clarkson et al. 2008). Socio-political theories that have the potential to explain climate change disclosures include political economy theory, legitimacy theory and stakeholder theory. Gray, Owen and Adams (1996, p. 47) define political economy theory as “ ... the social, political and economic framework within which human life

takes place”. The main idea of this theory is that political, social and economic activities cannot occur in the absence of one of these elements. Pressure is exerted on firms from several stakeholders. Therefore, financial, social and environmental disclosure is used to provide information to different recipients in order to meet their interests (Deegan 2009). That is, firms voluntarily disseminate information to either seek support from particular stakeholders (such as government, customers or environmental organisations) or to mitigate pressure that is exerted on them from those stakeholders. In the context of climate change disclosures, it is possible that this information is reported to either seek the support of or mitigate pressure from stakeholders such as environmental organizations, customers or government, and that this information would tend to be presented in a positive light. A lack of disclosure could be interpreted as indicating that significant climate change related pressure is not being exerted or that public disclosure is not seen as a suitable way to mitigate this pressure or to seek the support of stakeholders.

Stakeholder and legitimacy theories have been derived from political economy theory (Deegan 2009). Legitimacy theory assumes that companies disclose more information about their performance in order to maintain their legitimacy within society. The legitimacy notion stems from the social contract concept (Cormier and Gordon, 2001), where an organization derives its legitimacy from the contract between it and society. Social and environmental disclosure can be used by an organization as a tool to deal with society’s demands and needs (Freedman & Jaggi 2005; Lindblom 1994). As with political economy theory, legitimacy theory suggests that this information would tend to be presented in a positive light and may take the form of ‘soft’ unverifiable disclosures or diversionary information rather than verifiable information signalling real action on climate change (Clarkson et al, 2008). Stanny (2010) documents that while there is a high rate of response to the CDP survey, there is a low rate of disclosing detailed information about carbon emissions and the strategies to deal with climate change. She interprets this disclosure behaviour as support for legitimacy theory.

According to stakeholder theory, an organisation is considered as a part of the social system. This system consists of several groups that are working together to achieve the system’s targets. The achievement of an organisation’s goals cannot be achieved in the absence of considering its stakeholders’ interests (Freeman 1984; Freeman & Reed 1983). Freeman (2001 p. 59) states “Corporation have stakeholders, that is, groups and individuals who benefit from or are harmed by, and whose rights are violated or respected by, corporate actions”. Stakeholder theory assumes that firms take actions in order to meet the expectations of particular stakeholders who

have the power to impact on their performance (Deegan 2009). In relation to disclosure practices, firms have incentives to disclose relevant information to particular stakeholders in order to convince them that they are complying with their requirements. Cormier, Gordon and Magnan (2004) argue that managers' perceptions about stakeholders' interests are a key determinant of environmental and social disclosure practices. They attribute this to 'an intrinsic commitment' from managers toward stakeholders. It is likely that climate change disclosures are made to meet the expectations of stakeholders, particularly powerful stakeholder groups such as customers or investors.

Stakeholder theory suggests that climate change disclosures would tend to be presented in a positive light. A lack of disclosure could be interpreted as indicating that public disclosure is not seen as a suitable way to communicate with powerful stakeholders. One particularly powerful group of stakeholders that have been exerting pressure on companies to disclose more information about their climate change activities are institutional investors (Cotter and Najah, 2011). Collective action by this stakeholder group has been spearheaded by the CDP via requests to complete its questionnaire. Responding to the questionnaire is a disclosure channel that may represent either a substitute or supplement to the sustainability report. Further, Reid and Toffel (2009) explore corporate responses to shareholder activism and find that companies that have been targeted, and companies in industries in which other companies have been targeted, by shareholder actions on environmental issues are more likely to publicly disclose information to the CDP.

Similar to the socio-political theories outlined above, voluntary disclosure theory (Dye, 1985; Verrecchia, 1983) is an economics based theory that suggests positive rather than negative climate change related information will be disclosed. The point of difference is that voluntary disclosure theory proposes that the disclosures will take the form of 'hard' verifiable information that cannot be easily replicated by companies with a poor track record in relation to their climate change activities. This difference in the nature of disclosures is outlined by Clarkson et al (2008) in relation to environmental disclosures more broadly. Voluntary disclosure theory proposes that company managers will communicate firm 'quality' or value through communication channels such as voluntary disclosure, product warranties or the financial accounts. In the case of voluntary corporate disclosures about climate change, managers of firms that are performing strongly provide additional information to investors to help them in making investment decisions. The potential for undervaluation provides an incentive to disclose this information to investors.

On the other hand, proprietary costs theory provides an incentive for managers not to disclose some information voluntarily (Healy & Palepu 2001). This theory argues that managers may be reluctant to disclose more information if they believe it contains proprietary information which can be harmful to their firm (Dye 1985; Verrecchia 1983, 1990). Proprietary cost theory has the potential to explain a lack of detailed climate change disclosure about some aspects of corporate climate change activities. That is, firms could be motivated to not disclose detailed information about their carbon emissions forecasts; energy consumption costs and forecasts; new energy efficiency technologies and carbon reduction plans and initiatives. Disseminating such information can be used by competitors to harm a firm's competitive advantage.

Each of the theories outlined above has the potential to explain at least some aspects of corporate climate change disclosure or a lack thereof. There are several reasons supporting the disclosure of positive information about climate change activities, although the nature or verifiability of the predicted disclosures varies between socio-political and economics based theories. Potential reasons for non-disclosure of this information include a lack of socio-political pressures or expectations, poor climate change related performance, competitive forces or a preference for disclosure channels other than the company website or annual or sustainability report.

Prior to analyzing the climate change disclosures of our case study company in light of these theories, we investigate the mandatory and voluntary reporting guidance that has the potential to impact these disclosures.

### **3. Climate change reporting guidelines**

#### *Australian regulatory requirements and authoritative guidance*

The first National Greenhouse and Energy Reporting (NGER) annual reporting period began on 1 July 2008. Australian corporations that meet the NGER threshold [1] must report their greenhouse gas (GHG) emissions, energy production and consumption, and related information to the Department of Climate Change and Energy Efficiency. The Department makes this information publically available via its web site, however it is not required to be included in the companies' annual or sustainability reports.

Disclosures that are required to be made in company reports are specified in the Corporations Act 2001. Section 299A requires company directors to report

information reasonably required to make an informed assessment of the operations of the company, the company's business strategy and its prospects for the future. [2] Further guidance about what these disclosures might include is provided in ASX Guidance Note 10. This guidance note proposes that companies should focus on those matters that are of most significance to the company, and it provides detailed guidance related to disclosures across several key areas. Some of these areas of detailed guidance could reasonably be interpreted to include information about the impacts of climate change on a corporation's operations and activities.

First, detailed guidance is provided about disclosures on company objectives and corporate strategy. **Requirement 7**: "It should outline the opportunities and risks in respect of the industries and locations in which the company operates and the legal, social and political environments which affect the company and its activities." The impacts of climate change and related risks and opportunities could be included as part of this discussion in company reports. The regulatory environment surrounding climate change and the potential impacts of having a price on carbon seem particularly pertinent. Discussion of corporate strategy and actions that the company is taking to maximise opportunities and minimise climate related risks would also be informative. The importance of discussing risks and their management is further emphasised in **Requirement 9**, which focuses on the main factors and influences that may have a major effect on future results. The discussion in this requirement is around principal risks, opportunities and threats and their management. Further, the section on risk management states that "The review should contain a discussion of the company's risk profile and risk management practices if these are not dealt with elsewhere in the Annual Report." (ASX, 2003, page 16)

Second, **Requirement 8** states that "The review should include a discussion and analysis of key financial and non-financial performance indicators (KPIs) used by management in their assessment of the company and its performance." GHG emissions reduction targets and performance against them could reasonably be included as part of this discussion. Finally, **Requirement 31** pertains to corporate governance and how it is linked to business strategy and performance. A description of the corporate governance actions taken to address climate change could be incorporated in this discussion.

While there appears to be plenty of scope for directors to include the types of information demanded by investors as part of their review of operations and activities, neither the impacts of climate change nor GHG emissions are specifically

mentioned in either the Corporations Act or ASX Guidance Note 10. Hence, Australian companies are able to choose the extent and nature of any such disclosures, and indeed whether to disclose this information in their public reports at all.

### *Voluntary reporting frameworks*

While there is little regulation requiring specific climate change disclosures in company reports, there is evidence of a growing demand for increased climate disclosure and for standardised reporting guidelines. For example, Mr Bob Welsh, Chair of Australian based Investor Group on Climate Change (IGCC) made the following statement in their Carbon Disclosure Project Report 2008: Australia and New Zealand (page 6)

*“[I]nstitutional investors need companies to understand and transparently disclose their carbon footprints. It is critical that strategies to deal with both the associated risks and opportunities for businesses arising from climate change are developed and are clearly communicated. Effective reporting is vital.”*

The response of institutional investors and other stakeholders to voluntary, market-based disclosure initiatives indicates that stakeholder demand for climate disclosure has driven private action faster than either regulators or politicians have addressed the underlying issues. (Smith, Morreale and Mariani, 2008) An example of a voluntary disclosure scheme that includes disclosures about climate change and its impacts is the Global Reporting Initiative. This voluntary sustainability reporting framework covers a range of KPIs related to economic, environmental and social performance, including several in the area of climate change. These relate to GHG emissions and initiatives to reduce them, as well as energy consumption and reduction initiatives. In 2009, 69 organisations in Australia, including global corporations and small/medium sized enterprises, registered their use of the G3 Guidelines with GRI. Australia is now the fourth largest reporter against GRI, following Spain, USA and Brazil (GRI website, focal point Australia update).

Further, the formation and activities of the Carbon Disclosure Project (CDP) indicate a clear demand for climate change information by the investment community. The CDP is an independent, not-for-profit organisation that represents 534 institutional investors with over US\$64 trillion in assets under management. It collects climate change data from approximately 2500 companies around the world by asking them to respond to its questionnaire. Questions relate to risks and opportunities, GHG emissions accounting, performance against targets and plans to reduce GHG

emissions and governance approach to climate change. This questionnaire was sent to 4500 companies globally in 2010, including all companies comprising the ASX200. 76 Australian companies responded.

Despite the CDP's success in achieving a high global response rate to its request for climate related information, criticisms have emerged about the degree of commensuration [3] or standardisation of the information provided. (Kolk, Levy and Pinske, 2008) "Even experienced analysts of climate change and emissions data find it very hard to make sense of firm reporting as part of CDP." (Kiernan, 2008, cited in Kolk Levy and Pinske, p. 741) These authors conclude that voluntary carbon disclosure via the CDP questionnaire remains "inconsistent and difficult to interpret". This view was supported in the results of a recent survey of Australian superannuation funds by the Asset Owners Disclosure Project (2010), an organisation formed to assess Australia's superannuation funds preparedness to manage the risks and maximise the opportunities associated with climate change. Upon the release of this report, the Australian Institute of Superannuation Trustees commented that "Australia also needed a comprehensive reporting framework for climate issues." (Sinclair, 2010) Similarly, Smith, Morreale and Mariani (2008) conclude that what is required is the development of an effective language for climate disclosure embodied in a detailed set of guidelines, which companies can then be required to apply to their own, widely divergent business and prospects, for all material matters.

The CDSB was formed "in response to increasing demands for standardised reporting guidelines on the inclusion of climate change information in mainstream reports." See <<http://www.cdsb-global.org/>>. Its board comprises members from a consortium of business and environmental organisations. [4] In addition to the board, it has an advisory committee and a technical working group which include accounting professional bodies, relevant government and non-government organisations, global corporations, and multinational accounting firms. (CDSB, 2009a, 2009b) [5] The CDSB framework is relatively new and has not yet received the widespread support shown for the GRI Guidelines or the CDP questionnaire. The draft CDSB reporting framework was launched for comment in May 2009. [6] This reporting framework is quite explicit in its requirements, prescribing detailed disclosures across several key aspects of climate change impacts. It appears to meet investor demands for a standardized set of detailed climate disclosure guidelines. This framework is not industry specific and it provides a nexus around which guidance and principles related to climate disclosure can be developed over time.

The CDSB framework aims to link climate disclosures to information about financial performance and mainstream financial reports. To this end, the CDSB framework adopts relevant principles from financial reporting and seeks to establish the organisational boundaries used in financial reporting as the consolidation approach for climate disclosures. (CDSB, 2009a) The CDSB framework draws on the disclosure requirements of leading climate change disclosure initiatives including

- the Global Reporting Initiative (GRI),
- The Climate Registry (TCR),
- CDP, and
- research conducted by the Investor Network on Climate Risk (INCR) coordinated by CERES.

These sources reveal general consensus that the types of information that should be considered in preparing climate change-related disclosures falls into four categories:

- strategy and governance,
- risks and opportunities,
- GHG emissions, and
- activities a company takes to mitigate and/or adapt to climate change. (CDSB 2009b)

The CDSB adopts the GHG Protocol for preparing an emissions inventory, the de facto standard on emissions monitoring and measurement.

The draft CDSB framework includes four reporting templates that provide guidance on what disclosures to make, how disclosures should be identified and presented, and what supporting contextual information to provide. The types of disclosures proposed for each template are shown in Table 1. The first focuses on strategic analysis. The next two templates address regulatory and physical risks, including how these risks are being managed. The final reporting template relates to GHG emissions data. Overall, the disclosures proposed in the reporting templates are substantially more comprehensive, detailed and specific to climate change than those required by authoritative sources in Australia.

**Table 1 Climate Disclosure Standards Board Reporting Framework Templates**

<p>Template 1: Strategic Analysis</p>	<ul style="list-style-type: none"> <li>• Climate change position</li> <li>• Actions to maximize opportunities</li> <li>• Actions to minimize, manage, and/or adapt to the risks (Besides Templates 2 and 3)</li> <li>• GHG emissions reduction targets and its performance</li> </ul>
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	<ul style="list-style-type: none"> <li>● Future outlook</li> <li>● Actions related to corporate governance</li> </ul>
Template 2: Regulatory Risks	<ul style="list-style-type: none"> <li>● Existing climate change-related regulations, policies or government sponsored initiatives</li> <li>● Jurisdictions affected by these regulations</li> <li>● Trends, events, commitments and uncertainties affected by these regulations</li> <li>● Implementation costs and its impact</li> <li>● Impact on customers, supply chain, domestic and international markets etc</li> </ul>
Template 3: Physical Risks	<ul style="list-style-type: none"> <li>● Identification and description of the physical risks</li> <li>● Methods to assess the physical risks</li> <li>● Risk categorization</li> <li>● Regions or locations vulnerable to these physical risks</li> <li>● Impact on supply chain, customers, and the markets</li> <li>● Actions to mitigate against or adapt to the physical risks</li> <li>● Risk management and control measures</li> </ul>
Template 4: GHG Emissions	<ul style="list-style-type: none"> <li>● Total gross direct (Scope 1), and indirect (Scope 2) GHG emissions</li> <li>● Activities to reduce or compensate for Scope 1 and/or Scope 2 GHG emissions</li> <li>● Indirect (scope 3) emissions from sources not owned or controlled by the reporting organization</li> <li>● Direct (Scope 1) and indirect (Scope 2) GHG intensity by reference to non-financial output</li> <li>● Contextual disclosures on GHG emissions</li> </ul>

#### 4. Case study: Climate change disclosures for a large Australian company

##### *Methodology*

To inform our analysis of the climate change disclosures of our case study company, we evaluate them relative to (1) a comprehensive evaluation tool based on the CDSB's draft reporting framework, (2) two other disclosure mechanisms (GRI and CDP), (3) existing Australian regulations and authoritative guidance, and (4) relevant theories of voluntary disclosure.

The comprehensive evaluation tool that we develop for this research provides a benchmark to evaluate corporate climate disclosures and is a scoring system that incorporates both qualitative and quantitative climate disclosures. It is based on the four templates of the draft CDSB framework: strategic analysis, regulatory risk, physical risk, and GHG emissions. For each template, we categorize the types of

disclosures required by the CDSB framework and assign a disclosure code (1A, 1B(i), 1B(ii), 1C etc). There are a total of 60 types of disclosures in our scoring system, and they closely align with the items specified in the CDSB templates.

20 of the disclosure types are relatively broad and lend themselves to more detailed disclosures. We therefore assign a possible score of 2 for these detailed qualitative disclosures, compared to a possible score of 1 for other qualitative disclosures. This results in a total possible score of 80 for qualitative disclosures. In addition, we allocate a possible score of 1 for quantitative disclosures related to each of the 60 disclosure items; thus giving a total possible score of 140. [7] For disclosure types where we have assigned a possible score of 2, full marks are assigned for qualitative disclosures that include both detailed and relevant information, while a score of 1 is assigned for relevant qualitative disclosures that are lacking in detail. If no qualitative disclosure is provided, a score of 0 is given. Where a quantitative disclosure is made, an additional score of 1 is recorded.

Content analysis is used with our scoring system to convert qualitative climate change disclosures to quantitative form. Content analysis is generally considered to be a suitable method for analyzing corporate disclosures and has been widely used in corporate social responsibility research (Holder-Webb et al. 2009). According to Parker (2005), 19 percent of social and environmental research conducted in the period 1988-2003 employs content analysis. However, the coding system varies between studies, while some researchers use an indexing technique (sometimes called binary value); other studies use a rating or weighting system to score the disclosure level. In the indexing approach, a researcher resorts to scoring disclosures based on the presence or absence of particular information in the context under analysis. In this method, a researcher assigns one point for the presence of certain information, and zero otherwise. This process ignores the quality and detail of disclosures. On the other hand, the weighting approach avoids the weakness of the indexing method by assigning scores based on the quality of information (Wiseman 1982). Prado-Lorenzo et al (2008) construct an unweighted index of 19 items to capture the quantity of climate change information disclosed. However, the quality and nature of the disclosures is not considered as part of their index.

Using and combination of the indexing and weighting approaches to content analysis outlined in our climate disclosure scoring system above, we calculate both a sustainability report score and a CDP response score for our company of interest. The 'sustainability report score' includes disclosures made in the company's sustainability report, annual report and on its web site. [8] The 'CDP response score'

evaluates the company’s response to the CDP 2009 questionnaire. The CDP questionnaire response score is provided for two reasons. First, the company refers readers to its CDP 2009 response as part of its climate disclosures. [9] Therefore, while the CDP response is not replicated in the company’s own climate disclosures it could be considered as part of a more extensive suite of climate disclosures that the company has made. Second, the company’s CDP response can be used as an alternate benchmark against which to assess the climate disclosures made in its sustainability report.

A fundamental issue in the use of content analysis is reliability of coding. First, the data should be consistently coded. Second, stability can be improved by producing disambiguation rules; that is, rules that the coder can refer back to when recoding later. Because our scoring system involves some subjectivity, the scoring was undertaken independently by two of the authors. Any differences in scoring between these authors were then reviewed by the third author and discussed by all three authors until a consensus was achieved.

### *Analysis*

The detailed scoring system and the analysis of the disclosures made by the case study company are shown in Appendix 1; while a summary of these scores are shown in Table 2 below. A striking result from our analysis is that our company does not generate as much information in its sustainability report as in its CDP response. For its sustainability report, it has an overall score of only 36 out of 140, which represents a mere 25.7 percent of the total possible mark. It receives a score of 25 out of 80 for its qualitative disclosures, with only 17 of the 60 items addressed. Quantitative information is provided for just 11 of the disclosure items.

**Table 2 Overall Climate Disclosure Scores**

	CDP Response Score			Sustainability Report Score		
	Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
Total scores for all disclosure types:	66	28	<b>94</b>	25	11	<b>36</b>
Total possible scores	80	60	<b>140</b>	80	60	<b>140</b>
Percentage Scores	82.5%	46.7%	<b>67.1%</b>	31.3%	18.3%	<b>25.7%</b>

On the other hand, our company provides an integrated and detailed response to the CDP 2009 questionnaire. As a result, it obtains a score of 66 out of 80 for its

qualitative disclosures, and 28 out of 60 for its quantitative disclosures. In total it gains a climate disclosure score of 94, which is 67.1 percent of the full mark of 140. [10] When just the qualitative component of the disclosure score is considered, the percentage score is even higher at 82.5%.

A comparison of sustainability report and CDP scores indicates that while this company was capable of providing quite detailed climate disclosures in its sustainability report, it chose not to. However readers of the sustainability report are referred to the company's CDP response, which appears to indicate a complementary relationship between the two climate change disclosure mechanisms. That is, a more comprehensive and detailed set of information is provided in the CDP response relative to the sustainability report and is available should readers of the sustainability report require more information. Further, completion of the CDP questionnaire represents a relatively direct form of communication with a powerful coalition of stakeholders, institutional investors. It is possible that the sustainability report is seen primarily as a way of communicating with stakeholders other than institutional investors, and that these other stakeholders do not require such an extensive set of disclosures to meet their information needs related to climate change. For example, it is likely that only a limited set of selected climate change information is needed to seek the support of, mitigate pressure from, or meet the expectations of other stakeholders such as customers, government or community groups.

This company's climate disclosure score for its qualitative disclosure from its sustainability report is slightly more than one third of that from its CDP questionnaire response. Similarly, the score for its quantitative disclosure is less than a half of its CDP response. Interestingly, many of the items that are disclosed in its CDP response, but not in its sustainability report, can be considered 'hard' disclosures. That is, they are more technical and often require some numbers to be estimated. In contrast, those disclosed in the sustainability report are relatively less specific. This difference may reflect perceptions that the broad group of readers of sustainability reports is not necessarily interested in the same extent of technical climate data needed for investor valuation purposes. The sustainability report covers a wide range of information including environmental management, customers, employees, community and economic performance. Other potential reasons for choosing not to disclose more of this 'hard' information in the sustainability report are that the information is not considered material or that there is a high degree of uncertainty surrounding the information. Voluntary disclosure theory suggests that high quality companies will use hard, verifiable disclosures to differentiate

themselves from poorly performing companies that are unable to replicate these disclosures; thus reducing the potential for undervaluation of the company's shares. Observed differences in the nature of climate change disclosures between the sustainability report and CDP questionnaire response appear to indicate that the CDP response is the primary channel of communication with large investors.

As shown in Table 3, another pattern emerges in the differences in the items which our company has responded to in its CDP response, but not in its sustainability report. When the sustainability report is considered, none of the disclosures required under template three (physical risks) are provided, while disclosures related to template two (regulatory risks) are minimal. Similarly, the ASX Market Supervision review of corporate governance disclosure in annual reports for the year ended 30 June 2008 (ASX, 2009) shows that only 4% of Australia's top 300 companies disclosed information about climate change risks and this is even lower for smaller companies.

A possible explanation for the lack of disclosure about these risks is that the information is proprietary. However competitor companies are able to access some information about these risks from the CDP response, so it is likely that truly proprietary information would not be disclosed via that medium either. Another possible explanation is that there is considerable uncertainty surrounding the identification or quantification of these risks. This is especially likely to be the case for physical risks, and the low score for these in the CDP response lends some support to this explanation. A final possibility is that at least some of these risks are difficult to mitigate, representing 'bad news', and are therefore not something that companies have an incentive to disclose voluntarily.

Considerably more disclosure is provided for templates one (strategic analysis) and four (GHG emissions), although there are sections of these templates that are devoid of substantial disclosure. These include disclosures about GHG reduction targets and performance against those targets, information related to the future outlook for the company, corporate governance actions taken to address climate change, and contextual disclosures on GHG emissions. The choice of which information to provide in the sustainability report does not seem to be a function of compliance with requirements of the Corporations Act and ASX Guidance Note 10, since some of the information that is excluded clearly falls within the ambit of risks, the potential impact of these risks on future results, key non-financial performance indicators, and corporate governance. This result seems to indicate that for this company at least, existing regulatory requirements and authoritative guidance are not persuasive when it comes to climate change related disclosure.

**Table 3 Climate Disclosure Scores by Template**

	Possible score (Qual. disclosure)	Possible score (Quant. disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
Template 1 Strategic Analysis	34	27	29	13	<b>42</b>	13	5	<b>18</b>
Template 2 Regulatory Risk	10	5	10	3	<b>13</b>	3	1	<b>4</b>
Template 3 Physical Risk	13	7	10	2	<b>12</b>	0	0	<b>0</b>
Template 4 GHG Emissions	23	21	17	10	<b>27</b>	9	5	<b>14</b>

Areas that are given the most attention in the company’s reports and web site include a discussion of the actions that the company is taking to maximize opportunities and minimize risks related to climate change, and information about GHG emission. In relation to climate change risks and opportunities, it appears that the choice of what to disclose about climate change in the sustainability report is somewhat skewed towards ‘good news’. This observation is not surprising and aligns with the predictions of socio-economic theories as well as voluntary disclosure theory. In contrast, it is likely that the reason that GHG emissions are well reported is that the company focuses on compliance with established reporting frameworks such as the Global Reporting Initiative in its sustainability report disclosures. Indeed, an examination of this possibility reveals that our case study company reports on all of the GRI KPIs related to GHG emissions and energy consumption (EN16-18 and EN3-7). The declared level to which the company has applied the GRI Reporting Framework is B+, which appears to indicate at least a reasonable level of compliance and that the report has been externally assured. Further, the NGER disclosures form a subset of these GRI disclosures and are therefore also well reported in the sustainability report. This result supports that of Reid and Toffel (2009), who find that companies that operate under carbon emission trading laws or in countries with proposals to issue new emissions constraint laws have higher emissions disclosure levels than their counterparts from other countries.

Overall, our results show that the extent of disclosure about climate change in this company’s sustainability report is low compared to both our evaluation tool and the company’s CDP questionnaire response. The extent of disclosure varies across the

four disclosure templates and between qualitative and quantitative disclosures. When compared with the CDP response, the information disclosed in the sustainability report lacks detail and is more qualitative than quantitative. Further, the information disclosed tends to be positive or ‘good news’. The disclosures made in the sustainability report align well with the requirements of NGER and the GRI G3 Guidelines. On the other hand, they do not appear to be driven by the authoritative guidance provided in ASX Guidance Note 10.

## **5. Conclusions and policy implications**

The results of this research appear to support calls for increased regulation of climate change disclosure by Australian companies. There is a growing demand, particularly from large investors, for more disclosure and increased standardization of reporting in this area. Existing Australian corporate reporting requirements do not specifically mention climate change, nor do they provide sufficient guidance about the reporting of climate change risks and opportunities, their management, or key climate change related performance indicators. Further, there appears to be a lack of compliance with at least some of the authoritative guidance that has been issued.

Our case study results indicate that there seems to be a lack of sufficient disclosure in company reports and web sites about several aspects of climate change impacts and their management. It is possible that our results, which are based on just one large Australian company that has received commendations for its climate disclosure record, do not reflect the climate disclosure practices of other Australian companies. Indeed, it is likely that many other companies disclose significantly less climate related information in their annual and sustainability reports. On the other hand, it is likely that the extent and quality of disclosure varies by sector and companies in other sectors may report more than the energy sector company that we examine. Further research on a larger sample is needed to clarify the climate disclosure practices of the broader group of Australian companies.

Our results show that the disclosures that are made tend to lack technical detail and are somewhat skewed towards the more positive aspects of climate change impacts and management. This perceived positive bias potentially reflects the high quality of this company, and may also indicate that the sustainability report is being used to garner the support of stakeholders such as customers, government, employees, environmental organizations and community groups. Likewise the seemingly selective choice of which information to disclose in the sustainability report relative to that contained in the company’s response to the CDP questionnaire appears to

indicate that these disclosures are being used to present the company in a positive light rather than representing an unbiased and transparent reporting of climate change information. However the company does refer readers to its CDP response, where more detailed and comprehensive information has been provided. To this extent, the CDP response can be seen as a supplement to the sustainability report. Indeed, the substantial difference in the quantity and quality of information provided in the CDP response relative to the sustainability report appears to indicate that the company may be attempting to meet the differential information needs of institutional investors and other stakeholders. The CDP response rather than the sustainability report appears to be the main communication channel with these large investors.

There are several possible ways to address the gap between the demand for comprehensive and standardized climate change information and the deficiencies observed in both current regulatory requirements and disclosure practices. Embracing a similar approach to that taken in the US, that is, issuing interpretive guidance, would help to ensure that Australian companies considered the impacts of climate change when making their review of operations, strategy and prospects; thus at least partially meeting the demand for this type of information. In the US, the SEC provides public companies with interpretive guidance on existing SEC disclosure requirements as they apply to business or legal developments relating to the issue of climate change. The rules cover a company's risk factors, business description, legal proceedings, and management discussion and analysis. (SEC, 2010) However adopting this approach in Australia would not meet investor demand for standardized reporting guidelines. The usefulness of disclosures made under such a regime would be compromised due to lack of comparability between reporting entities. Further, criticisms about the difficulty in interpreting and incorporating such divergent information into investment decisions are unlikely to be allayed by such an approach. An advantage of this approach would be that Australian company directors would be able to decide which climate change related matters are of most significance to the company, and to focus their disclosures on these.

Another potential approach would be to make minimal or no changes to existing requirements, thus leaving climate change disclosure in corporate reports as an essentially voluntary scheme. Institutional investors are able to get the information that they require from CDP responses, at least for those companies that provide a comprehensive response to the CDP questionnaire. However, reporting to CDP is not a suitable alternative to the provision of more detailed and comprehensive climate disclosure in company reports for at least two reasons. First, the CDP data is not as

readily accessible to report users since report users need to register with CDP to be able to view the company's response. More importantly, the CDP data suffers from insufficient commensuration of the disclosed information; thus making it inconsistent and difficult to interpret. (Kolk, Levy and Pinske, 2008)

A superior approach to ensuring effective climate change disclosure would be to require or at least recommend the adoption of a comprehensive climate disclosure framework, since effective disclosure requires both a universal language and a standardized set of rules (Smith, Morreale and Mariani, 2008). Our case study results suggest that at least some companies prefer to report against schemes like GRI and CDP that contain specific and detailed reporting requirements, and the growing number of large Australian companies choosing to report against these voluntary initiatives supports this conjecture. This trend towards compliance with these detailed reporting schemes, combined with the limited compliance with current authoritative guidance, suggests that a climate change reporting framework could be a more effective approach to regulation in this area than open ended guidance. Positive bias in the information reported is also likely to be reduced if a comprehensive reporting framework is employed compared to leaving the choice of what to report completely voluntary.

The GRI is a standardized reporting framework and is a potential candidate. However its scope is much broader than just climate change disclosure and requiring or recommending compliance with this framework would necessarily extend to reporting of other non-financial performance indicators including those related to other aspects of environmental and social performance. Further, the GRI guidelines do not appear to support the extent of climate change information demanded by institutional investors, since the content of the CDP questionnaire suggests that more comprehensive disclosures are needed by this important stakeholder group. On the other hand, the CDSB's Climate Change Reporting Framework represents a comprehensive yet focused climate change disclosure framework. It offers a conceptual and practical input for regulatory agencies by working to develop an international framework for corporate reporting on climate change. An aspect of this framework that is particularly appealing is that it aligns with IASB Conceptual Framework and notions of decision-usefulness and other qualitative characteristics. (CDSB, 2009a) Of the alternatives discussed, the CDSB framework appears to have the most potential to mitigate the gap between demands for standardized climate change information and current disclosure practices.

## References

ASX 2003, Guidance Note 10: Review of Operations and Activities: Listing Rule 4.10.17, March.

ASX 2009, Analysis of Corporate Governance Disclosure in Annual Reports for the year ended 30 June 2008.

CDSB 2009a, The Climate Disclosure Standards Board (CDSB) Reporting Framework: Exposure Draft, May.

CDSB 2009b, Climate Disclosure Standards Board Copenhagen Update, COP 15, December.

CERES 2009, Climate risk disclosure in SEC filings, CERES & Environmental Defense Fund.

Clarkson, P, Li, Y, Richardson, GD & Vasvari, FP 2008, 'Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis', *Accounting, Organizations and Society*, vol. 33, no. 4-5, pp. 303-27.

Cormier, D & Gordon, IM 2001, 'An examination of social and environmental reporting strategies', *Accounting Audit and Accountability Journal*, 14(5), 587-16.

Cormier, D, Gordon, I & Magnan, M 2004, 'Corporate Environmental Disclosure: Contrasting Management's Perceptions with Reality', *Journal of Business Ethics*, vol. 49, no. 2, pp. 143-65.

Cotter, J & Najah, M 2011, 'Institutional investor influence on global climate change disclosure practices' SSRN eLibrary.

Deegan, C 2009, *Financial Accounting Theory*, 3 edn, McGraw Hill, Australia.

Doran, K & Quinn, E 2009, 'Climate Change Risk Disclosure: A Sector By Sector Analysis of SEC 10-K Filings from 1995–2008', *North Carolina Journal of International Law and Commercial Regulation*, vol. 34, pp. 721-67.

Dye, R 1985, 'Disclosure of Nonproprietary Information', *Journal of Accounting Research*, vol. 23, no. 1, pp. 123-45.

Freedman, M & Jaggi, B 2005, 'Global warming, commitment to the Kyoto protocol, and accounting disclosures by the largest global public firms from polluting industries', *The International Journal of Accounting*, vol. 40, no. 3, pp. 215-32.

Freeman, R 1984, *Strategic management: A stakeholder approach*, Pitman-Ballinger, Boston.

Freeman, R 2001, 'A stakeholder theory of the modern corporation', in T Beauchamp & N Bowie (eds), *Ethical theory and business*, 6edn, PrenticeHall, NewJersy.

Freeman, R & Reed, D 1983, 'Stockholders and stakeholders: a new perspective on corporate governance', *California Management Review*, vol. 25, no. 3, pp. 88-106.

Gray, R, Owen, D & Adams, C 1996, *Accounting and accountability: changes and challenges in corporate social and environmental reporting*, Prentice Hall, LondonEurope.

Healy, P & Palepu, K 2001, 'Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature', *Journal of Accounting and Economics*, vol. 31, no. 1-3, pp. 405-40.

Holder-Webb, L, Cohen, JR, Nath, L & Wood, D 2009, 'The supply of corporate social responsibility disclosures among US firms', *Journal of Business Ethics*, vol. 84, no. 4, pp. 497-527.

Investor Group on Climate Change, *Carbon Disclosure Project Report 2008: Australia and New Zealand*.

Kiernan, M.J. 2008, *Climate change and investment risk*, Presentation at the Amsterdam Global Conference on Sustainability and Transparency, GRI, Amsterdam.

Kim, E.H. and Lyon, T.P. 2008, *When does institutional investor activism pay? The carbon disclosure project*, unpublished working paper, University of Michigan.

Kolk, A., Levy, D. and Pinske, J. 2008, *Corporate responses in an emerging climate regime: The institutionalization and commensuration of carbon disclosure*, *European Accounting Review*, 17(4), pp. 719-745.

Lindblom, C.K., 1994. *The implication of organizational legitimacy for corporate social performance and disclosure*, Presented at the Critical Perspectives Conference.

Parker, LD 2005, 'Social and environmental accountability research: a view from the commentary box', *Accounting, Auditing & Accountability Journal*, vol. 18, no. 6, pp. 842-60.

Patten, D 2002, 'The relation between environmental performance and environmental disclosure: a research note', *Accounting, Organizations and Society*,

vol. 27, no. 8, pp. 763-73.

Peters, G.F & Romi, A.M. 2009, "Carbon disclosure incentives in a global setting: An empirical investigation", working paper, Applied Sustainability Centre, University of Arkansas.

Prado-Lorenzo, JM, Rodriguez-Dominguez, L, Gallego-Alvarez, I & Garcia-Sanchez, IM 2009, 'Factors influencing the disclosure of greenhouse gas emissions in companies world-wide', *Management Decision*, vol. 47, no. 7, pp. 1133-57.

PricewaterhouseCoopers Australia 2008, *Carbon value: Robust carbon management – a framework to protect and enhance shareholder value in response to climate change*.

Reid, EM & Toffel, MW 2009, 'Responding to Public and Private Politics: Corporate Disclosure of Climate Change Strategies', SSRN eLibrary.

SEC Staff Accounting Bulletin No. 99, 64 Fed. Reg. 45150, 1999.

SEC 2010, Commission Guidance Regarding Disclosure Related to Climate Change, 17 CFR PARTS 211, 231 and 241 [Release Nos. 33-9106; 34-61469; FR-82]

Sinclair, K. 2010, Funds dither on climate issues, *The Courier Mail*, 16 March.

Smith, J.A., Morreale, M. and M.E. Miriani 2008, Climate change disclosure: Moving towards a brave new world, *Capital Markets Law Journal*, 3(4), pp. 469-485.

Stanny, E 2010, 'Voluntary Disclosures by US Firms to the Carbon Disclosure Project', SSRN eLibrary.

Stanny, E & Ely, K 2008, 'Corporate environmental disclosures about the effects of climate change', *Corporate Social Responsibility and Environmental Management*, vol. 15, no. 6, pp. 338-48.

Verrecchia, R 1983, 'Discretionary disclosure', *Journal of Accounting and Economics*, vol. 5, pp. 179-94.

---- 1990, 'Information quality and discretionary disclosure', *Journal of Accounting and Economics*, vol. 12, no. 4, pp. 365-80.

## Endnotes

1. The thresholds specify amounts for both GHG emissions and energy use, and reduce over time to capture more companies.
2. This includes the CLERP 9 Act requirement for companies to include in their directors' reports information reasonably required to make an informed assessment of the entity's business strategies and its prospects for future financial years. Therefore, if matters such as climate change have a material effect on the future viability of business, they need to be disclosed.
3. Commensuration of climate disclosure is defined by Kolk, Levy and Pinske to mean that it "provides a reporting format that allows easy direct comparison across firms" (page 729).
4. The CDSB board comprises members from CDP, CERES, The Climate Group, The Climate Registry, International Emissions Trading Association, World Economic Forum, and World Resources Institute. The CDSB was formed at the 2007 annual meeting of the World Economic Forum, and the CDP acts as secretariat for the CDSB.
5. Another example of a voluntary climate change disclosure framework is the Global Climate Disclosure Framework for Oil & Gas Companies. This framework has been issued jointly by the Institutional Investors Group on Climate Change (Europe), CERES (North America), and the Investor Group on Climate Change (Australia and New Zealand).
6. Since completing this research, a revised edition of the CDSB framework has been issued. This revised version includes several substantive improvements and is much shorter than the exposure draft version upon which this research is based.
7. While it is quite unlikely that a quantitative disclosure would be made for some of the items, we do not eliminate the possibility from our scoring system.
8. For the remainder of this discussion, the term 'sustainability report' will be used to refer to the company's sustainability report, annual report and website disclosures. To analyse website disclosures, all potentially relevant pages were analysed in the same way that relevant aspects of the annual and sustainability report were. That is, a manual reading and coding of all potentially relevant disclosures was carried out.
9. The company refers readers to the CDP web page. From here interested investors can navigate to this particular company's CDP questionnaire response and can view the response upon registration with CDP.
10. There were a total of 10 unanswered items, among these there are five (1D(v), 1F(v), 4F, 4G, and 4H(x)) that do not match with any of the CDP questions. Hence, every company who responds to the CDP 2009 questionnaire would get zero for these five items.

## Appendix 1 – Climate Disclosure Scoring System and results for a large Australian company

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
<b>Template 1 – Strategic Analysis</b>								
1A	A statement of the company's position on climate change:							
1A(i)	Whether management perceives that the implications of climate change already, or will in future, impact the company's business strategy.	1	0	0	0	1	0	1
1A(ii)	An analysis of the implications of climate change for competitiveness and access to resources.	2	2	0	2	0	0	0
1B	An explanation of all significant actions the company is taking to maximise opportunities associated with climate change including:							
1B(i)	participation in emissions trading schemes;	2	2	0	2	2	1	3
1B(ii)	research and development, investment in clean energy technologies, and development and design of new products and services.	2	2	1	3	2	1	3
1C	An explanation of all significant actions the company is taking to minimize, manage, and/or adapt to any risks associated with climate change that are not addressed under Templates 2 and 3 (may include litigation and reputational risk) including a description of the processes and actions taken to:							
1C(i)	improve the company's systems;	2	2	0	2	1	1	2
1C(ii)	development of carbon abatement and renewable energy projects;	2	2	1	3	2	1	3
1C(iii)	engage with policy makers.	2	2	1	3	1	0	1
1D	GHG emissions reduction targets, and an analysis of performance against those targets. This information is decision useful when it:							
1D(i)	Describes the nature of the plans (e.g. whether they involve GHG emissions reductions, energy efficiency and/or diversification, managing reliance on fossil fuels and so on).	1	1	0	1	1	0	1
1D(ii)	Explains the GHG reduction target (where one is set) including the type of target, whether absolute or intensity-based.	1	1	1	2			0
1D(iii)	Explains the GHG reduction target (where one is set) including the timescales over which the company aims to achieve the target.	1	1	1	2			0

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
1D(iv)	Explains the GHG reduction target (where one is set) including the target base year and GHG emissions for that year. The base year is the first or starting year against which emissions are evaluated towards the achievement the target.	1	1	1	2			0
1D(v)	Explains the GHG reduction target (where one is set) including an explanation of the circumstances in which the target base year emissions have been or may be re-calculated retrospectively.	1	0	0	0			0
1D(vi)	Explains other goals and timescales that have been set under the plan and the key performance indicators against which those goals will be evaluated.	1	1	1	2			0
1D(vii)	Specifies the organizational boundary and the GHG emissions activities and/or sources to which the plans apply.	1	1	0	1	1	0	1
1D(viii)	Describes the activities and investments required to achieve the plans and any risks or limiting factors that might affect achievement of the plans and/or targets.	1	1	1	2			0
1D(ix)	Analyzes progress to date against previously set plans or targets.	2	2	1	3			0
1E	Information about the future outlook for the company. This information is useful when:							
1E(i)	There is a reasonable basis for it and any assumptions, uncertainties, or key dependencies that might affect it are disclosed.	1	0	0	0			0
1E(ii)	There is a direct link between the future outlook related to climate change and the company's assessment of its longer term objectives and strategies.	1	1	0	1			0

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
1E(iii)	It describes, or cross refers to parts of the mainstream financial report that describe long term strategic developments that may enhance opportunity or increase risk, such as organic growth, acquisitions or divestments, operational changes.	1	1	1	2			0
1E(iv)	It includes estimates of investment in or the cost of GHG abatement or climate change adaptation that could materially affect the growth, future earnings and/or direction of the company.	1	1	1	2	1	1	2
1E(v)	It includes an estimate (together with the methodology/rationale used for the estimate) of future movements in direct and indirect GHG emissions, taking account of expected GHG emissions/energy efficiency and reduction plans.	1	1	1	2			0
1E(vi)	It estimates any cost savings associated with GHG abatement/energy efficiency expectations.	1	0	0	0			0
1F	A description of corporate governance actions taken to address climate change including:							
1F(i)	The governance processes and organizational resources the company has assigned to the identification and management of climate change issues.	1	1	0	1			0
1F(ii)	Whether the Board is engaged on climate change.	1	1	0	1			0
1F(iii)	How responsibility for climate change is delegated and how executives are held accountable for and/or rewarded for implementation of the company's climate change strategy.	1	1	1	2			0

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
1F(iv)	The nature and reliability of the underlying information and control systems used in tracking GHG emission information and providing climate change disclosures.	1	1	0	1	1	0	1
1F(v)	Whether the company's climate change information is subject to the same governance processes and disclosure controls and procedures as are used for other financial reporting information.	1	0	0	0			0
		<b>34</b>	<b>29</b>	<b>13</b>	<b>42</b>	<b>13</b>	<b>5</b>	<b>18</b>

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
	<b>Template 2 – Regulatory risk</b>							
2A	A description of the existing climate change-related regulations, policies or government sponsored initiatives, including participation in carbon trading activities that affect the company.	2	2	1	3			0
2B	An overview of how and in which jurisdictions the regulations impact the business, how the rules are implemented and the associated implementation costs.	2	2	1	3	2	1	3
2c	An explanation of known or anticipated trends, events, commitments and uncertainties in climate change regulation that are reasonably likely to have a material impact on the financial condition or the operating performance of the company. Disclosures might include a report on the effect on the company and the shareholder value of possible regulation scenarios, including an analysis based on an appropriate range of carbon costs and the secondary effects of regulation such as increased energy and transportation costs.	2	2	1	3			0
2D	An analysis of how possible regulations to reduce GHG emissions may affect the cost of carbon and how this could impact your business.	2	2	0	2			0
2E	A description of the way in which regulation affects or may affect the company through customers, supply chain, domestic and international markets etc.	2	2	0	2	1	0	1
		10	10	3	13	3	1	4

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
	<b>Template 3 - Physical risk</b>							
3A	Identify and describe the physical risks to which your company is exposed.	1	1	1	2			0
3B	Explain how those risks are assessed.	2	2	0	2			0
3C	Categorize risks as current, short-term, medium-term or long-term and explain the timescales involved.	2	1	0	1			0
3D	Name the regions or particular locations that are particularly vulnerable to the risks you have identified, for example, because of installations based in those areas, particular vulnerability to resource shortages brought about by climate change, etc.	2	0	0	0			0
3E	Explain whether you have considered the effect of physical risks from climate change on your supply chain, your customers, and the market generally and if so, how those risks that are external to the company might affect your business and operations.	2	2	0	2			0
3F	Describe actions or plans your company is taking or may implement to mitigate against or adapt to the physical risks you have identified.	2	2	1	3			0
3G	Describe how risk management and control measures are used in your business to manage the actual and potential physical effects of climate change.	2	2	0	2			0
		13	10	2	12	0	0	0

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
	<b>Template 4 – GHG emissions</b>							
4A	Total gross direct (Scope 1) GHG emissions in CO2 equivalent metric tonnes.	1	1	1	2	1	1	2
4B	Total gross indirect (Scope 2) GHG emissions associated with the use of purchased electricity, steam, heating and cooling in CO2 equivalent metric tonnes.	1	1	1	2	1	1	2
4C	A measure of direct (Scope 1) and indirect (scope 2) GHG intensity by reference to the company’s revenue.	1	1	1	2			0
4D	A description of activities during the reporting period that have reduced or compensated for Scope 1 and/or Scope 2 GHG emission, for example, the purchase of offset credits, acquisition of renewable energy certificates, energy/emissions efficiency gains etc. Disclosures might include the amount in CO2 equivalents of Scope 1 and/or Scope 2 GHG emissions reduced or compensated for as a result of those activities.	2	2	1	3	2	1	3
4E	Indirect (Scope 3) emissions from sources not owned or controlled by the reporting organization but which are a consequence of the activities of the reporting organization.	1	1	1	2	1	1	2
4F	A measure of direct (Scope 1) GHG intensity by reference to non-financial output.	1	0	0	0			0
4G	A measure of indirect (Scope 2) GHG intensity by reference to non-financial output.	1	0	0	0			0
4H	Contextual disclosures on GHG emissions should:							
4H(ii)	Confirm the name or names of the Standard, national or regional program, industry guidelines or trading scheme used to calculate GHG emissions.	1	1	0	1	1		1

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
4H(iii)	State the quantification methodology for calculating GHG emissions, in particular whether results are: Calculation/estimation based (e.g. emissions factors applied to activity data, models or material/mass balance), taken from continuous or intermittent direct measurements, or based on a combination of measurement and calculation/estimation methods.	2	1	0	1	1		1
4H(iv)	Disclose all assumptions made in the preparation of results.	1	0	0	0			0
4H(v)	Specify any calculation tools used to prepare results.	1	0	0	0			0
4H(vi)	Disclose emissions factors and/or the source of emissions factors used to calculate indirect emissions from activity data.	1	1	0	1			0
4H(vii)	In support of Scope 2 (indirect) GHG emissions figures companies should provide details in KWh, MWh or GWh of the purchased electricity the company has consumed.	1	1	1	2			0
4H(viii)	Disclose the global warming potentials used and the source.	1	1	0	1			0
4H(ix)	Describe the main sources of uncertainty in calculations of Scope 1 (direct) and scope 2 (indirect) emissions e.g. data gaps, assumptions, extrapolation, metering/measurement, inaccuracies etc.	1	1	1	2			0
4H(x)	Describe intensity measures in accordance with Framework Section 6 so that users are able to assess the company's performance in the context of its industry sector.	1	0	0	0			0
4H(xi)	State whether Scope 1 (direct) and Scope 2 (indirect) emissions results have been verified or assured in house or by an independent third party. If so, disclosures should state what level of assurance has been provided (e.g. limited or reasonable), the scope of emissions covered by the verification or assurance exercises and the standard(s) by reference to which the verification or assurance was conducted.	1	1	0	1			0

Disclosure code	Description of Disclosure Types	Possible marks (qual disclosure)	CDP Response Score			Sustainability Report Score		
			Qual. disclosure	Quant. disclosure	Total	Qual. disclosure	Quant. disclosure	Total
4H(xii)	State whether emissions reported for the accounting year vary significantly compared to previous years and/or whether a recalculation of the base year emissions has been triggered by structural change to the business.	1	1	1	2	1	1	2
4H(xiii)	State the reporting year for GHG emissions disclosures.	1	1	0	1	1		1
4I	Disaggregated disclosures: A segment breakdown of Scope 1 direct emissions and Scope 2 indirect emissions in CO2 equivalent metric tonnes should be provided for the main countries or regions in which the reporting organization operates, taking account of local trading and regulatory reporting schemes and the relative regulatory risks in countries classified under Annex 1 and Annex 2 according to the UN Framework Convention on Climate Change process, in order to decide which segments are most exposed to risk.	1	1	1	2			0
4J	Further disaggregation of disclosures: Scope 1 direct and scope 2 indirect emissions information should be subdivided where this aids transparency, by business units/facilities; source types (stationary combustion, process, fugitive, etc); activity types (production of electricity, transportation, generation of purchased electricity that is sold to end users etc); each of the six "Kyoto" GHGs (CO2, CH4, N2O, HFCs, PFCs and SF6).	1	1	1	2			0
		23	17	10	27	9	5	14
	Total scores for all disclosure types:	80	66	28	94	25	11	36
	Total possible scores		80	60	140	80	60	140
	Percentage Scores		82.5%	46.7%	67.1%	31.3%	18.3%	25.7%