

Disclosure on climate change: Analysing the UK ETS effects

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HIGHLIGHTS

- Study organisations that took part in the UK Emissions Trading Scheme (UK ETS).
- Compare disclosure produced on climate change in annual and standalone reports.
- Suggest a coding instrument based on a synthesis of disclosure recommendations.
- UK ETS did influence corporate environmental disclosure on climate change.
- Disclosures in annual and standalone reports are different and may be complementary.

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ABSTRACT

The objective of this paper is to explore the nature of disclosure on climate change in annual and standalone reports of organisations who took part in the UK Emissions Trading Scheme (UK ETS). This article uses content analysis to codify disclosure in order to compare disclosure in different media as well as the possible effect that membership in an emissions trading scheme may have had on reporting. The results suggest the UK ETS was associated with differences in disclosure. This study contributes to the literature by providing a longitudinal study in two disclosure media in the UK ETS context.

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1. Introduction

The accounting literature is increasingly exploring topics related to society and the natural environment with a focus on disclosure. Studies exploring corporate disclosure of social and environmental issues vary, with some seeking to explore potential determinants of disclosure (Beck, Campbell, & Shrives, 2010; Bouten, Everaert, & Roberts, 2012). There are also debates about the advantages and disadvantages of voluntary versus compulsory social and environmental disclosure (Andrew & Cortese, 2011; Cowan & Deegan, 2011; Lodhia & Martin, 2012; Uddin & Holtedahl, 2013).

Despite the lively debate on the value of voluntary versus compulsory disclosure, a considerable emphasis is given to voluntary disclosure and the range of media in which this type of disclosure has been found (Coulson, 2008; Cowan & Deegan, 2011; Haque & Deegan, 2010). Annual reports are the most popular reporting media studied in this literature, typically because organisations produce annual reports more regularly than other sources of disclosure. However, attention has also been focused on standalone reports produced by organisations (Gray, Kouhy, & Lavers, 1995a; Hackston & Milne, 1996; Hooks & van Staden, 2011). These reports are variously described and are known as environmental reports, sustainability reports and corporate social reports. Recently studies focused on disclosure provided on webpages have also emerged (see for example Hooks & vanStaden, 2011). Moreover, there is literature that explores how disclosure varies across these different media (Coulson, 2008; Haque & Deegan, 2010).

The literature also explores a diverse array of disclosure topics and perceptions of the quality of disclosures produced (Beck, et al., 2010; Hasseldine, Salama, & Toms, 2005). Other studies describe aspects disclosed on a single topic, such as AIDS/HIV (Soobaroyen & Ntim, 2013) and climate change (Freedman & Jaggi, 2005; Haque & Deegan, 2010). Finally, the literature also contains articles that explore disclosure in particular countries (Bouten, Everaert, VanLiedekerke, DeMoor, & Christiaens, 2011; Gray, et al., 1995a; Guthrie, Cuganesan, & Ward, 2008; Hackston & Milne, 1996).

This article also explores voluntary corporate disclosure. Our emphasis is to examine disclosure on climate change using a coding instrument (developed by the authors) to analyse (and compare) the nature of disclosures produced by different groups of organisations in different media (annual and standalone reports). This article summarises disclosures on climate change produced by direct participants in the UK Emissions Trading Scheme (UK ETS),ⁱ as well as a comparator group to these direct participants over five years. New Institutional Sociology is used as a lens to describe the possible influence that the UK ETS may have had on the nature of disclosure on climate change. In summary, our longitudinal analysis suggests the UK ETS was associated with differences in disclosure in two disclosure media. Our exploration of the impact of UK ETS on the nature of disclosure on climate change may provide insight into future practices because there is an expectation that more trading schemes will be implemented.

The article is organised as follows. The second section analyses the accounting literature on disclosure on climate change. The third section discusses how New Institutional Sociology can contribute to the current literature by describing changes in disclosure practices. The fourth section describes the UK ETS's origin and characteristics. The fifth section presents the research approach, including the research questions, sample and method used. The sixth section describes the empirical findings by comparing disclosure on climate change produced by the two sets of organisations in two different media. The seventh section presents the paper's final comments.

2. Accounting literature on climate change

A broad range of approaches can be identified in the accounting literature that explores issues related to climate change. As an illustration, Bebbington and Larrinaga-Gonzalez (2008) made a macro evaluation of risks and uncertainties that emissions trading schemes may have for financial and non-financial accounting; this theme was further developed in a special issue on *Accounting, Organisation and Society* in 2009. This area of the literature has been growing because there is still no financial accounting standard to guide the recognition of emissions allowances in financial statements.

More recently, there was another special issue on the *Accounting, Auditing and Accountability Journal* in 2011/12, which provided multiple perspectives on accounting for carbon. Aspects discussed in this special issue included footprinting by local

authorities, different frameworks to account for carbon and a critical perspective on emissions trading. Another relevant special issue in *Journal of Cleaner Production* in 2012 made connections between climate accounting and sustainability management. In this issue, articles studied definitions of carbon accounting, the use of voluntary disclosure on climate change by investors and how to embed sustainability in disclosure on carbon emissions. Another special issue on carbon accounting was also recently published in the *Social and Environmental Accountability Journal*.

Two main subsets of the literature on disclosure on climate change are relevant to this research. The first relevant aspect in the literature relates to the quality of voluntary disclosure on climate change and the range of media in which this type of disclosure is presented. The articles exploring this topic suggest the quality in disclosure on climate change varies by media, such as annual reports, standalone reports and webpages. In addition, disclosure on climate change is identified as difficult to compare and of a poor quality overall. For example, Coulson (2008) analyse Lloyds' disclosure on climate change and observes that Lloyds uses multiple vehicles for communications, including annual reports, standalone reports (in the form of their corporate social reports and annual corporate responsibility reviews) as well as other documents (including the Carbon Disclosure Project and employee magazines). Coulson (2008) concludes that different information was provided in response to different stakeholder audiences. Similarly, Simnett and Nugent (2007) found that Australian organisations tend to provide more complete disclosure in standalone reports compared to annual reports

(while noting that there are poor levels of disclosure and external assurance provided in both media – these findings were echoed by Haque and Deegan, 2010).

Some authors attempted to establish comparisons between organisations in order to evaluate their disclosures. Pinkse and Kolk (2009) find that some companies are not transparent with regard to the methodology used to calculate emissions and targets while others used different methodologies over time (hampering any comparative or trend analysis). Sullivan et al. (2008) also highlights that companies do not clearly describe how they treat emissions from their subsidiaries and do not include total operations when creating emissions inventories.

The second aspect from the literature that is relevant to this research is the relationship between regulations and corporate disclosure on climate change. Some authors identified that disclosure on climate change can influence the design of regulations. Andrew and Cortese (2011) applied critical dialogic engagement to suggest that different disclosure media could have an impact on mandatory and voluntary governance regimes because reports are a source of information to policymakers, educators, academics, investors and creditors. In a similar vein, Lodhia and Martin (2012) used an agenda-setting framework to analyse the disclosure made by organisations and other stakeholders at National Greenhouse and Energy Reporting (NGER) in Australia and conclude that disclosure may impact the design of future legislation.

However, the literature also stresses the reverse effect where various regulations have a differential influence on corporate disclosure on climate change. As an illustration, Kim and Lyon (2010) suggest an economic model to analyse the relationship between emissions reductions and disclosure in a voluntary greenhouse gas registry. Freedman and Jaggi (2005) analyse annual reports and used legitimacy theory to explain the fact that organisations from countries that signed the Kyoto Protocol had higher quality disclosure (on the basis of the index they developed) compared to companies from other countries. Prado-Lorenzo, Rodriguez-Dominguez, Gallego-Alvarez, & Garcia-Sanchez (2009) use insights of legitimacy (and stakeholder theory) to identify that GRI indicators are relevant drivers of disclosure on greenhouse gas emissions. Higher levels of disclosure (including use of GRI indicators) were found in webpages of organisations from countries that signed the Kyoto Protocol. In a different jurisdiction, Cowan and Deegan (2011) also use legitimacy theory to note that organisations tactically use annual reports to communicate to society their response to the Australian's National Pollutant Inventory.

Many of the articles that address the impact of regulations on disclosure on climate change tend to focus on concepts of legitimacy theory to reinforce a belief that corporate disclosure is used for manipulative purposes (Higgins & Larrinaga-Gonzalez, 2014). In this article, we argue that elements other than organisations' self-interest can also explain corporate disclosure. In addition, the studies discussed above do not

elaborate much on the influence of regulations on the quality of disclosure provided by different groups of organisations over time. This leads us to believe that institutional theory may provide an alternative lens to understanding carbon disclosure.

Despite the fact that institutional theory considers legitimacy as part of institutions, its use of that concept differs from legitimacy theory (Higgins & Larrinaga-Gonzalez, 2014). The resource-based view of legitimacy is the most common approach adopted in this area. This approach perceives legitimacy as resources (or a way to achieve resources) from which organisations are dependent for survival (Higgins & Larrinaga-Gonzalez, 2014: 163). Thus, legitimacy tends to take a strategic and manipulative connotation (Higgins & Larrinaga-Gonzalez, 2014). Institutional theory tends to minimise the emphasis on 'calculative' and 'self-interested' behaviour by recognising influences of an institutional environment in which not only coercive forces but also other elements, such as taken-for-granted values, inform organisational practices (Higgins & Larrinaga-Gonzalez, 2014: 282).

Taking the view that "accounting is shaped by its institutional context; its form and role is determined by the organisational environment and it also helps to shape this environment" (Moll, Burns, & Major, 2006:183), institutional theory thus provides a dynamic perspective to understanding organisational practices (such as corporate disclosure) over time (Higgins & Larrinaga-Gonzalez, 2014). Moreover, institutional

theory also offers concepts to explore how these practices became common in a particular context (Higgins & Larrinaga-Gonzalez, 2014).

The next section explores concepts of New Institutional Sociology and its contribution to this study.

3. New Institutional Sociology

There are several branches of institutional theory (DiMaggio & Powell, 1991a; Peters, 1999; Scott, 2008), with the accounting field tending to draw on three branches (Moll, et al., 2006), namely: New Institutional Economics, Old Institutional Economics and New Institutional Sociology. This article concentrates on the New Institutional Sociology.

New Institutional Sociology emerged in the 1960s (Coase, 1960), reflecting a renewed interest by economists in the study of institutions within a neo-classical economics framework (Moll, et al., 2006). New Institutional Sociology focuses its analysis on institutionalised elements which reduce variety and promote organisational homogeneity (DiMaggio & Powell, 1991a). DiMaggio and Powell (1991b) stress that isomorphism is the process that best describes this homogeneity. For these authors, the influence of the external environment (e.g., market competition and inter-institutional pressures to adopt new values, norms and attitudes) are the drivers of isomorphic changes. The influence of the external environment and institutional context create a need for adaptation, and institutions can only survive by isomorphic change. This need

for adaptation is referred to by DiMaggio and Powell (1991b) as “the iron cage”. DiMaggio and Powell (1991b) also suggested that isomorphic change happens through three mechanisms: coercive (formal and informal pressures exerted by other organisations), normative (usually arising from professionalisation) and mimetic (referring to organisational tendencies to copy each other) processes.

New Institutional Sociology has been criticised for focusing on institutional stability (Fernandez-Alles & Valle-Cabrera, 2006). However, there are recent efforts to explore the process of change in New Institutional Sociology studies (Colyvas, 2007; Oliver & Holzinger, 2008; Seo & Creed, 2002). The dynamic aspect within New Institutional Sociology arises because it assumes that institutions are influenced by the external environment which is itself constantly changing and that organisations also influence each other to absorb these transformations in the external environment (DiMaggio & Powell, 1991b). According to New Institutional Sociology theorists, institutional change occurs via three institutional pillars (Scott, 2008), namely: regulative (institutions’ regulative behaviour), normative (values and norms) and cultural-cognitive (shared concepts from social realm) pillars.

This study will focus on the mechanism of isomorphic change (DiMaggio & Powell, 1991b) to analyse the effect of regulation on reporting practices by focusing on organisations exposed to a particular regulatory context. Institutional theory has also been previously used to analyse organisational responses to emissions trading. As an

illustration, Pinkse and Kolk (2007, 2009) used the work of Oliver (1991) and Suchman (1995) to study multinational responses to carbon marketing. Pinkse (2007) also used institutional theory to identify what drives companies to engage in emissions trading. As such, this article contributes to the literature on institutional theory by studying impacts the UK ETS may have had on the nature of disclosure on climate change. The most relevant prior study exploring the UK ETS context is by Roeser and Jackson (2005), who analysed disclosure produced by FTSE 100 companies and participants in the UK ETS. These authors made conclusions about the general characteristics of disclosure on climate change. For example, they conclude that the information provided used different parameters (such as different time periods) and it did not include comparative data, both of which made evaluation of performance difficult.

Our research also complements the work of Roeser and Jackson (2005) in the following aspects. First, this study provides a longitudinal analysis of disclosure, including two years before the UK ETS started, the year it started and two years after that. Second, this research compares disclosure on climate change in two media: annual and standalone reports. Third, using the lens of New Institutional Sociology, this study compares the disclosure produced by two sets of companies, UK ETS participants and non-participants. Alongside an expectation of the introduction of more trading schemes (Lazarowicz, 2009; NAO, 2009) this work might provide insights into possible future practices. For example, Udding and Holtedahl (2013) note that there is a need for a unifying approach to greenhouse gas accounting. The analysis of the impact that

different emissions trading schemes' requirements may have on the nature of disclosure in different media may contribute to enhancing this process. With this in mind, the next section describes the research questions, data and methodology used in this research.

4. The UK ETS

Before proceeding to the data analysis, a brief outline of the UK ETS will be provided. The UK ETS involved a total of 32 organisations (called direct participants) who undertook to voluntarily reduce their emissions. In return, £215 million (in total) was given to direct participants if they met their emissions reduction target. To create a market to support this regulation, reductions in greenhouse gas emissions were converted into allowances and direct participants could trade their allowances (which consisted of emissions reductions) or save them for the future years. In common with other schemes of this type, direct participants could choose to reduce their emissions or buy allowances to cover emissions if they exceeded their targets (NAO, 2004).

The UK ETS was designed to run from 2002 until 2006 (NAO, 2004; NERA Economic Consulting, 2004). The timing of this scheme can be explained by reference to its aims. The UK ETS sought to achieve three main objectives: (i) achieve cost-effective emissions reductions; (ii) prepare companies for emissions trading, especially within the context of the (then forthcoming) European Emissions Trading Scheme (EU ETS) and (iii) establish an emissions trading centre in London (NERA Economic Consulting, 2004). The EU ETS

was due to start in 2005, and hence participating in the UK ETS from 2002 would provide companies with experience with emissions trading ahead of that time.

In an assessment of the scheme, organisations believed that direct participants learned from the UK ETS. Outcomes highlighted by direct participants included learning how to set targets, how to trade and how to monitor, report and have emissions audited (ENVIROS, 2006). Surveys of participants identified the economic aspects of emissions trading as the main motivation for organisations' participation in the UK ETS. For example, von Malmborg and Strachan (2005) used a questionnaire to ask direct participants to rank their motivations for participating in the scheme. The results suggested that direct participants searched for a fit between their economic interests and the impact of the scheme (none of the 19 responses cited moral, social and ethical responsibility grounds as being the main reason they participated in the UK ETS). In addition, Nye and Owens (2008) argue that organisations participated in the UK ETS in order to avoid compulsory legislation which could lead to them incurring high operational costs. Indeed, the voluntary participation in the UK ETS gave organisations the opportunity to self-regulate, incurring little economic risk and promoting 'green impression management' (Nye & Owens, 2008).

The UK ETS is an interesting case to study because it was the first attempt by a government to create a market based on greenhouse gas emissions (NAO, 2004). In addition, under the UK ETS, organisations voluntarily committed to pre-established

conditions, such as specific emissions targets, rules for monitoring, verification and reporting and they were also entitled to receive monetary incentives (NAO, 2004; NERA Economic Consulting, 2004). These specific conditions make disclosure by the 32 direct participants of particular interest for this research because they help us investigate whether (or not) instruments of environmental policy are associated with different disclosure patterns. This type of question can be illuminated by New Institutional Sociology framing and the next section introduces this framing.

5. Research design and methods

The objective of this research was to examine the characteristics of disclosure on climate change produced by direct participants in the UK ETS. This general objective will be achieved by answering these two specific questions.

RQ1: What do organisations who were direct participants in the UK ETS disclose with respect to climate change in annual and standalone reports?

RQ2: What influence does being a direct participant in the UK ETS appear to have in disclosure with respect to climate change?

These two questions are different but they complement each other. The first question seeks to identify the characteristics of the disclosure in terms of volume and quality and how it changes over time. The motivation to develop an answer to this question is informed by the fact that climate change is a significant environmental concern and

hence how organisations respond to this agenda will dictate what outcomes might be achieved (IPCC, 2001, 2007, 2013; Stern, 2006). The second question seeks to shed light on the impact of the UK ETS on disclosure and it will be informed by comparing the disclosure produced by direct participants over time as well as a comparison of their disclosures with those produced by non-direct participants. The second element of the analysis is performed based on a matched pair procedure.

The matched pair approach is normally used to compare disclosure produced by different groups of organisations where each group differs in terms of industry and size (Buhr & Freedman, 2001; Deegan & Rankin, 1997). The idea behind the matched pair approach in this study is to control for these factors, which are known to be related to patterns of disclosure (see, for example, Deegan & Rankin, 1997) by comparing disclosure of similar sized companies in the same industry who are either in or out of the UK ETS. Given that these companies should experience similar pressures with respect to climate change, one could expect (using institutional theory) that they would have similar disclosures (Buhr & Freedman, 2001). By isolating (as far as possible) differences between the two groups of organisations it may be possible to discern the contribution that being a direct participant in the UK ETS could be inferred to have on disclosure.

To address these research questions, the first dataset is obtained by a matched pair approach. This set of data contains disclosures over the same time period and the same

media for organisation that are similar to each direct participant (as measured, for example, by size and industry). The second dataset captures disclosures made by UK ETS direct participants in their annual and standalone reports from 2000 until 2004. In this way, the disclosures of organisations that joined the UK ETS are measured, both before and after they joined the scheme. This creates the opportunity to explore whether changes in disclosure patterns coincide with changes in activities that were prompted by a change in the regulatory environment created by the UK ETS.ⁱⁱ

The direct participants comprise a total of 32 organisations that self-selected to participate in the UK ETS. The majority of the direct participants are companies (29) with the other three organisations being the Kirklees Council, the National History Museum and Battle McCarthy (a carbon club representing universities). Thus, the direct participants are a heterogeneous group of organisations that differ not only in terms of industry but also by size. Given that industry and size have been found to influence disclosure on climate change (Freedman & Jaggi, 2005; Prado-Lorenzo, et al., 2009), a matched pair approach was used to select a group of similar organisations to the direct participants in terms of industry and size. Several sources were used to create matched organisations' pairs, including the FTSE 500 ranking 2006ⁱⁱⁱ, data from the London Stock Exchange^{iv}, Amadeus database^v, Corporate Register webpage^{vi}, companies' reports, companies' webpages, performance indicators in higher education by Higher Education Statistic Agency and 2001 area classification for Local Authorities by the Office of National Statistics.

Disclosures were gathered using content analysis (which is a method used to codify information into categories that allows quantitative inferences to be drawn from the text). This article takes a similar approach to the work of Soobaroyen and Ntim (2013), who analysed disclosure across different dimensions. Therefore, the empirical analysis includes the following measures: (i) volume of disclosure, (ii) a measure of quality based on completeness of disclosure around four key management activities and (iii) a measure of quality based on the spread of disclosure around a number of possible disclosure topics. Each of these three measures will now be explained.

The volume of disclosure produced is captured in terms of the number of pages. There is a lively debate in the literature regarding the most suitable unit of analysis for capturing disclosures, including number of pages, number of documents, number of words, number of sentences, percentage of pages and percentage of total disclosure (Guthrie, et al., 2008; Unerman, 2000). Gray et al. (1995a) adopted number of pages as the basis for data measurement for two reasons. First, they argue that pages identify the total of space given to a topic, reflecting its relative importance. Second, the authors noted that pages are the easiest measure to do by hand. Unerman (2000) also argues that measure based on number of characters - words or sentences - also misses non-narrative disclosure issues, such as graphs and tables. This is an important point to consider because this research identified that there is a high incidence of graphs and tables in disclosure on climate change. For example, in this study, approximately 84% of reports

that presented disclosure on emissions on climate change showed information using tables or graphics. There are, however, limitations on the use of number of pages as a unit of analysis and numbers of sentences is one of the most popular measures in the literature (Guthrie & Abeysekera, 2006; Hackston & Milne, 1996; Joseph & Taplin, 2011). However, despite preferences for number of sentences as measurement, there is evidence that analysis using number of sentences and number of pages provide similar results (Hackston & Milne, 1996). Moreover, recent studies show that both number of pages and number of sentences have significant relationships with measures of disclosure quality (Hooks & van Staden, 2011).

Indeed, Bouten et al. (2011) noted that much has been done to understand the quality and quantity of disclosure. However, they also question if the disclosure of corporate social responsibility is providing comprehensible information. They emphasised that social and environmental reports can only be seen to discharge accountability if the disclosure concentrates on actions rather than intentions. Thus, they suggested that companies should produce disclosures that include: (i) vision and goals, (ii) management approach and (iii) performance indicators (see also Loew et al., 2004 and Beck et al., 2010). Taking this on board, disclosures around emissions data, targets, actions and other disclosure/narrative is also captured in this study. The four categories are captured in terms of volume of disclosure (measured by percentage of page). Moreover, these categories are based on steps viewed to be necessary in implementing management programmes to reduce greenhouse gas emissions (ISO, 2006; PCA, 2002).

With this in mind, these categories of disclosure can be used to interpret organisations' disclosure on the components identified as important for carbon management. For example, targets reflect organisations' objectives with respect to reducing greenhouse gas emissions with actions representing what organisations are doing to reduce emissions. Furthermore, disclosure on actions, narrative and other issues related to climate change may provide evidence about the strategy that organisations are adopting to achieve emissions reductions (Warsame, Neu, & Simmons, 2002). The literature suggested that a 'good' quality disclosure would thus contain both narrative and numerical information (Beck, et al., 2010; Hackston & Milne, 1996; Hooks & van Staden, 2011; Lang & Lundholm, 1993; Toms, 2002; Unerman, 2000). The four categories used in this study could, therefore, be argued to encompass elements that would allow 'good' disclosures to be made. Disclosure of emissions, targets, actions and other disclosure/narratives could be argued to be an important form of internal and external communication which enables tracking of organisations' progress in reducing emissions (DEFRA, 2010; IEMA, 2010).

The final disclosure measure links to literature on corporate disclosure that asserts the desirability of comparability, completeness and comprehensiveness (Bouten, Everaerta, et al., 2011). At the same time, the majority of studies addressing climate change disclosure highlight problems with comparability of data. Haque and Deegan (2010) note that the literature on climate change disclosure is not well developed so there is no readily accepted disclosure categorisation available. Indeed, Haque and Deegan (2010)

built their own categorisation to analyse governance based on documents produced by NGOs and research associations as a way to identify relevant practices related to climate change. This research follows a similar line to the work of Haque and Deegan (2010) in that a coding instrument was used for this study to provide an indication of comprehensiveness of disclosure. The basis of the coding instrument used consists of the four categories already noted (i.e., emissions data, targets, actions and other disclosure/narrative) with each category containing sub-categories that identify possible disclosures. The coding instrument synthesised the framework outlined by de Aguiar and Fearfull (2010)^{vii} and multiple greenhouse gas reporting guidelines (CDP, 2007; DEFRA, 2001, 2003, 2006; GRI, 2002, 2006; ISO, 2006; PCA, 2002; United Nations, 2004; WBCSD & WRI, 2004). As shown in Appendix 1 (adapted from Soobaroyen & Ntim, 2013), the four main categories are broken down into 25 sub-categories. A score is calculated using a binary basis: 1 if disclosed and 0 if not disclosed. Thus, the total of four main categories and 25 sub-categories should result in a total of 29 scores, which is considered to evaluate the disclosure on climate change.

There are also different media in which disclosure is found. However, Guthrie et al. (2008) state that it would be unmanageable to sample all types of possible media in one piece of research. Thus, Guthrie et al. (2008) suggest that authors select a manageable number of media types which can provide the answers to the research question proposed. As a result, this research concentrates on analysing disclosure produced in

annual reports and standalone reports. These two media were selected for several reasons.

First, annual reports have been the most popular media to capture corporate disclosure because they are regularly produced (Gray, et al., 1995a; Guthrie & Abeysekera, 2006; Guthrie & Boedker, 2006; Guthrie, et al., 2008). However, some authors note that an analysis of corporate social disclosure that concentrates exclusively on annual reports may not offer a complete picture of companies' disclosure (Unerman, 2000; Zéghal & Ahmed, 1990). Thus, standalone reports were included to complement the annual report data. This raises the possibility that webpages should also have been included in the study. While recent studies analyse social and environmental disclosure found in webpages, there is evidence that standalone reports provide a higher level of coverage on these topics compared to webpages (see for example Frost, Jones, Loftus, & Van der Laan, 2005; Hooks & vanStaden, 2011). Second, another relevant issue to consider in the context of this study are the problems faced when seeking a retrospective chronological analysis with no assurance that webpages will be the same as they were at the time period of the studies. Annual and standalone reports, therefore, provide clearer parameters with respect to selecting data to be analysed. Indeed, recent articles that analysed climate change disclosure on a chronological basis concentrate on annual and standalone reports (see for example Cowan & Deegan, 2011; Haque & Deegan, 2010). Third, the literature supports the value of a comparative study of disclosure in annual and standalone reports, which could be seen as representing, respectively,

organisations' 'financial' and 'social and environmental' image on climate change (Coulson, 2008; Gray, Kouhy, & Lavers, 1995b; Unerman, 2000). Annual and standalone reports both contain corporate disclosure, but they may show different patterns of disclosure and therefore may constitute different disclosure media, which influence different stakeholder audiences.

The rules for analysis were designed to guide the replicability of the instrument by a second coder. Building these rules was an extensive process that involved feedback received from the second coder (one of the authors) on interpretation/classification of different issues on climate change. Coders discussed different interpretations until agreement was achieved. Annual and standalone reports produced by direct participants during all five years selected were analysed twice by the same coder (one of the authors) with an interval of a week between the two rounds. Internal reliability was measured by Krippendorff alpha and a level of agreement above 80% was pursued (Hasseldine, et al., 2005; Milne & Adler, 1999). After initial comparison, where the level of disagreement was higher than 20% the analysis was redone in order to identify any errors made in the analysis and the 'right' coding was recorded. The final result of this analysis was an average level of assurance greater than 90%. After completing the internal reliability test, the next step was to prepare the data for the final analysis. An additional check was conducted with the objective of ensuring that all disclosure about climate change was included into the analysis. This check was made by searching for key words in reports' PDF files (see Appendix 2). Finally, a third coder checked a random

sample of 53 reports which represents 10% of the total reports analysed and differences were discussed (Lombard, Snyder-Duch, & Bracken, 2002; Milne & Adler, 1999)^{viii}.

6. Empirical findings and discussions^{ix}

6.1 Results

This section presents a summary of findings about the volume of disclosure. To achieve this objective, reports were divided into four main groups: (i) standalone reports produced by direct participants, (ii) standalone reports produced by matched pair organisations, (iii) annual reports produced by direct participants and (iv) annual reports produced by matched pair organisations.

Table 1 shows the total number of reports that contain disclosures on climate change for both standalone and annual reports produced by direct participants and matched pair organisations. A total of 351 reports^x from 528 possible reports (an average of 66%) contain some disclosure on climate change. Considering the total of reports that have disclosure on climate change (351 reports), annual reports produced by direct participants and its matched pair organisations represent 25% and 23% of that total, respectively. Likewise, standalone reports produced by direct participants and their matched pair organisations that contain disclosure on climate change represent 24% and 27%, respectively. In addition, while the average disclosure incidence was 66%, this varied by type of report with 100% and 98% of direct participant and matched pair organisations (respectively) disclosing in standalone reports and 54% and 45% of the

same organisations disclosing in annual report formats. Thus, it is fair to say that once reporting is undertaken, the incidence in annual and standalone reports of direct participants and matched pair organisations is very similar. This would suggest that being within the UK ETS does not have a significant impact on the incidence of climate change reporting. Different types of reporting, however, may exist.

[Table 1 about here]

Table 2 presents measures of the quantity (mean, median and mode) and dispersion (variance and standard deviation) of the four groups of reports on a cumulative basis over five years (from 2000 until 2004). Table 2 presents data only for those reports which had some disclosure on climate change issues (i.e., 351 reports). The disclosure volume did not vary greatly between report categories for direct participants and matched pair organisations, but it does not necessarily mean that UK ETS has not influenced disclosure. This is because it is expected that differences between direct participants and matched pair organisations may be associated with the type of disclosures made rather than the quantity of disclosure.

In addition, Table 2 shows that the standard deviation on matched pair organisations disclosure was higher than direct participants in standalone reports. This result may suggest that despite the fact that direct participants were a heterogeneous group (NERA Economic Consulting, 2004), participating in the UK ETS was associated with a more

common approach to disclosure in standalone reports (which is reflected in volume of disclosure).

[Table 2 about here]

Turning to the types of disclosure made, the most frequent category of disclosure across all media and groups was actions, followed by other disclosure, emissions and then targets (see Table 3). Emissions data were most frequently found in standalone reports rather than the annual reports. This pattern is consistent for direct participants and matched pair organisations with the exception of disclosure produced by direct participants in standalone reports. With regard to targets, direct participants present higher overall disclosures compared to matched pair organisations. This result is consistent with direct participants participating in an emissions trading scheme that requires systematic emissions reductions and hence robust knowledge of emissions profiles. This result may also suggest that the UK ETS affected organisations' disclosures of targets. Reporting of actions undertaken is consistent over all groups, which suggests that organisations (regardless of whether they participate in the UK ETS or not) are aware of (and hence are providing statements about) the need to respond to climate change in some way. 'Other disclosure' was more frequently found in standalone reports rather than annual reports, which reflects the wider array of disclosures on climate change that were found in the standalone reports.

[Table 3 about here]

Table 4 provides further details of disclosures. Based on a list of disclosure (Appendix 1), Table 4 presents incidence of reporting in categories and sub-categories used to build the disclosure score. In both direct participants and matched pair organisations, standalone reports contained a higher disclosure incidence than annual reports, which confirms the wisdom of the decision to open up analysis beyond annual reports. Indeed, if studies seek to understand disclosures holistically it would be unwise to focus solely on annual reports.

Two sub-categories were selected to measure quality of emissions disclosure: emissions level and indicators, respectively. In the both sub-categories, matched pair organisations show similar incidence of disclosure incidence compared to direct participant organisations. In terms of targets, Table 4 indicates that direct participants may use standalone and annual reports as key media in which to disclose targets. Direct participants had a higher incidence of disclosure in terms of targets compared to matched pair organisations. This happens in both standalone and annual reports. Thus, the use of targets appears to be driven by the direct participants, which would suggest the UK ETS participation makes a difference in this respect. This pattern of disclosure could reflect a more explicit/formal commitment from direct participants towards emissions reductions.

For actions, however, the pattern is mixed. It is apparent that once disclosures are broken down into more specific sub-categories, consistent patterns of disclosure do not exist. It is only possible to infer some sub-categories disclosed in the majority of standalone reports and these sub-categories are those in which levels of disclosure exceed 1/3 (C.2 Redesigning products/ process/services, C.5 Energy conservation, C.6 Renewable energy, C.7 Energy and fuel efficiency and C.12 Strategies/Management Programme). It is also important to highlight that only direct participants in standalone reports presented one additional sub-category in which levels of disclosure exceed 1/3 (C.20 Partnerships with external organisations). Thus, it is impossible to suggest on the basis of these data that there is a discernible difference in disclosure on different types of actions between direct participants and matched pair organisations.

Finally, direct participants present more narrative disclosures on climate change compared to matched pair organisations. This pattern happens in both standalone and annual reports. This may reflect that direct participants to some extent are more inclined to talk about their approach to climate change compared to matched pair organisations due to their engagement with a policy scheme.

[Table 4 about here]

Table 5 provides a summary picture of organisation's climate change disclosure through the use of descriptive statistics of disclosures over the four main categories, sub-

categories and total of scores. In terms of the four main categories, standalone reports show higher levels of disclosure compared to annual reports for both direct participants and matched pair organisations. This result suggests that the incidence of climate change disclosure in annual reports is still low (a pattern repeated for the sub-categories). Differences in disclosure produced in standalone reports by direct participants and matched pairs were not apparent when aggregated scores are calculated in Table 5. The difference in scores is more evident in annual reports in which direct participants presented higher scores compared to matched pair organisations, suggesting that for direct participants climate change has become more of an economic concern. The knock-on effect of having disclosures in annual reports is that these become evident to financial stakeholders who may not read standalone reports.

[Table 5 about here]

Cumulative disclosures were also calculated over three different periods, namely: (i) two years before the UK ETS started (2000 and 2001); (ii) the year UK ETS started (2002) and (iii) two years after UK ETS started (2003 and 2004). Table 6 shows the percentages of reports produced by direct participants in the UK ETS that disclose information on categories and sub-categories over these three periods. There was an increase in the percentages of reports that presented information on emissions, actions and other disclosure/narrative over this time. This pattern, however, was slightly different for

targets. For example, direct participants clearly increased the disclosure on targets in the year UK ETS started but reduced it after that.

A more detailed analysis can be made by examining sub-categories with incidence levels of disclosure that exceed 1/3, in order to identify for each sub-category what time period had the highest disclosure incidence. The results show that for the period before the UK ETS, there were only three sub-categories that exceed 1/3 of disclosure incidence (A1. Emissions levels, C.5 Energy conservation and C.7 Energy and fuel efficiency). However, this number increased to four sub-categories for the year in which UK ETS started (A1. Emissions levels, C.5 Energy conservation, C.6 Renewable energy and C.7 Energy and fuel efficiency). Finally, during the two years after the UK ETS started, incidence of disclosure increased to eight sub-categories (A1. Emissions levels, C.1 Use of new technologies, C.5 Energy conservation, C.6 Renewable energy and C.7 Energy and fuel efficiency, C.12 Strategies/management programme, C.20 Partnership with external organisations and D.1 Narrative). This result suggests that the UK ETS did have a positive impact on disclosure incidence (alongside what is likely to have been a general trend towards higher levels of disclosure on global climate change).

[Table 6 about here]

Table 7 shows the absolute scores for direct participants' reports over the three periods. The mean for all scores were higher after the UK ETS started compared to the years

before it started. However, the mean for additional and total scores after the UK ETS started are at low levels, representing 18% of additional scores and 26% of total scores. This reflects that the UK ETS had an impact on the quality of disclosure produced by direct participants but disclosure improvements were not substantial, showing that there were still room for improvement on organisations' engagement on disclosure on climate change.

[Table 7 about here]

6.2 Insights from New Institutional Sociology

According to the NAO (2004), the UK ETS emerged as a possible mechanism for achieving multiple (and potentially conflicting) objectives. On the one hand, the UK ETS sought emissions reductions and on the other hand, these reductions were looked for without affecting organisations' competitiveness. To achieve these two objectives, the UK Government wished to encourage cooperation between business and Government (NAO, 2004). The UK Government called on the business community to participate in UK ETS design and offered monetary incentives to organisations that participated in the scheme. The UK Government seemed to have attracted direct participants with the idea that it would be cost-efficient to participate in the UK ETS. Indeed, von Malmborg and Strachan (2005) note that the main reason given by direct participants to engage in the UK ETS was to receive incentive payments. In the same vein, Nye and Owens (2008) suggested that organisations' primary motivation in supporting economic instruments, such as emissions trading, is to achieve economic efficiency. However, the economic

rationale for doing so is diminished or constrained by existing policy frameworks or wider socio-economic contexts.

The pattern of disclosure found in this study may also provide some evidence that direct participants sought to comply with pressures for economic fitness while also reducing emissions. As an illustration, the results suggested that direct participants were more likely to disclose data on climate change in their annual reports, compared with matched pair organisations (Tables 2 and 5). This result was identified not only in terms of incidence of disclosure (Table 5) but also in terms of volume of disclosure (Table 2). According to Gray et al. (1995b), the annual report represents an organisation's construction of their own rationale and in these reports organisations tend to construct a financial image. As a result, social and environmental disclosure in annual reports could generate conflicts with organisations' financial ambitions (Gray, et al., 1995b). In this study, the relative emphasis on annual report disclosure suggests that direct participants found annual reports to be a more 'comfortable' location to disclose on climate change than matched pair organisations did. This could partially be explained by the fact that direct participants may have been try to legitimate their participation in the UK ETS and, as a consequence, may have tried to frame UK ETS in terms of economic imperatives.

Despite the fact that direct participants differ from each other in terms of size, economic activities, type and level of emissions (ENVIROS, 2006;

NERA Economic Consulting, 2004), the volume of disclosures made by them in standalone reports had a lower standard deviation compared with matched pair organisations (Table 2). This could be evidence of mimetic behaviour among direct participants. In addition, one possible influence on achieving levels of isomorphism could have been the compulsory measurement, reporting and verification (MRV) process set within the UK ETS. The UK ETS required an external verification process for all direct participants (ENVIROS, 2006; NERA Economic Consulting, 2004). Thus, the enforcement of similar MRV rules could have also influenced direct participants' mimetic behaviour around the volume of disclosure on climate change. These results could also confirm the findings of Bebbington et al. (2009) that mimetic pressures encourage corporate disclosure and influence its nature. Moreover, the higher incidence of disclosure on targets produced by direct participants (in both annual and standalone reports) compared to matched pair organisations may also support this suggestion.

Tables 6 and 7 showed evidence that the levels of incidence of disclosure produced by direct participants changed after the UK ETS starts compared to years before it started. This result is consistent with Rahaman, Lawrence and Roper's (2004) findings that corporate disclosure is influenced by normative, coercive and mimetic isomorphism, which could be achieved by compulsory pressures exerted on organisations to make them to comply with professional groups' (such as auditors') requirements to achieve similar and high standards of information. This result also supports Larrinaga-Gonzalez's

(2007) suggestion that corporate disclosure is not a static practice and that institutional pressures influence changes at organisational fields.

7. Final comments

Content analysis has frequently been used to explore corporate social disclosure, with studies now focusing on disclosure on climate change. This research provides a twofold input to this area. First, it explores differences in corporate disclosure in two different media: annual and standalone reports. Second, it analyses if membership of the UK ETS is associated with differences in the disclosure of organisations that participate in it. As such, this analysis contributes not only to the literature on corporate disclosure but it also helps to understand how disclosures may change over time under the influence of the UK ETS (see also Nye & Owens, 2008; Roeser & Jackson, 2005; Von Malmborg & Strachan, 2005). The findings of this research report on a very specific policy instrument in the UK context so generalisations are difficult to infer. Consequently, future research in this area could explore other emissions trading schemes in the UK and abroad. Despite this limitation, the UK ETS was a unique policy instrument with specific requirements. Hence, our findings can inform not only the accounting literature but policymakers on possible ways to enhance carbon accountability.

Another important contribution of this article is the application of a coding instrument, which synthesised a number of extant standards. This coding instrument not only develops categories to measure the quantity of disclosure but it also provides a measure

of quality of disclosure. This article reports on an analysis carried out on 528 reports produced by a subgroup of UK organisations over a five-year period and examined disclosure on climate change in annual and standalone reports. Hence, considering the UK ETS was a voluntary initiative, another interesting possibility for potential research is to apply the code instrument to explore how compulsory and voluntary emissions trading schemes impact voluntary disclosure on climate change.

Finally, this paper use the lens of New Institutional Sociology and suggests that instruments of environmental policy may influence corporate disclosure on climate change issues but that these impacts (at least for this sample of organisations) were not striking. In addition, despite the fact that annual and standalone reports both contain disclosure on climate change, they contain different patterns of disclosure. It may, therefore, be that these two forms of reporting constitute different (rather than complementary) disclosure media. Moreover, the use of annual and standalone reports for disclosure may represent responsiveness to diverse stakeholder demands that may vary depending on organisational context. In the case of the UK ETS, the increases in disclosures were mainly found in annual reports, suggesting that climate change has become an economic concern for direct participants of that scheme. Another interesting avenue for a future study involving institutional theory would be fieldwork to explore how organisations have responded to changes in climate change requirements. The results would contribute to the debate on the potential the New Institutional Sociology has to explain processes of change.

TABLES AND APPENDIXES

Table 1 –Number of reports that presented disclosure on climate change by year

	2000	2001	2002	2003	2004	Total	TOTAL REPORTS ANALYSED
Direct participants - standalone	13	15	19	20	20	87	87
Direct participants - annual report	12	17	20	20	17	86	160
Matched pair - standalone	14	18	20	22	22	96	98
Matched pair - annual report	13	14	17	16	22	82	183
Total						351	528

Table 2 - Measures of location and dispersion of volume of reporting (measured by number of pages)

	Mean	Median	Mode	Variance	Standard Deviation	<i>n</i>
Direct participants - standalone	1.05	0.59	0.22	1.30	1.14	87
Direct participants - annual report	0.14	0.08	0.02	0.03	0.16	86
Matched pair - standalone	1.49	0.88	0.44	2.79	1.67	96
Matched pair - annual reports	0.14	0.07	0.01	0.03	0.17	82

Table 3 – Disclosure by category (measured by percentage of reports where disclosures were made)

	Direct participants and standalone (<i>n=87</i>)	Direct participants and annual report (<i>n=86</i>)	Matched pair and standalone (<i>n=96</i>)	Matched pair and annual reports (<i>n=82</i>)
Emissions	92.0	30.2	88.5	37.8
Targets	66.7	40.7	55.2	24.4
Actions	94.3	84.9	97.9	78.0
Other disclosure	85.1	57.0	93.8	48.8

Table 4 – Disclosure by sub-category (measured by percentage of reports containing disclosure)

	Indicator	Direct participants and standalone (n=87)	Direct participants and annual report (n=86)	Matched pair and standalone (n=96)	Matched pair and annual reports (n=82)
A	EMISSIONS	92.0	30.2	88.5	37.8
A.1	Emissions level	72.4	14.0	75.0	26.8
A.2	Indicators	39.1	5.8	35.4	9.8
B	TARGETS	66.7	40.7	55.2	24.4
C	ACTIONS	94.3	84.9	97.9	78.0
C.1	Use of new technologies	50.6	17.4	41.7	8.5
C.2	Redesigning products/process/services	33.3	15.1	46.9	19.5
C.3	GHG Certifications	0.0	0.0	0.0	0.0
C.4	Waste disposal	24.1	12.8	18.8	2.4
C.5	Energy conservation	62.1	23.3	72.9	20.7
C.6	Renewable energy	34.5	19.8	33.3	7.3
C.7	Energy and fuel efficiency	57.5	25.6	70.8	15.9
C.8	Refrigeration and air conditioning improvements	5.7	2.3	24.0	1.2
C.9	Travel reductions	10.3	1.2	20.8	2.4
C.10	Logistics improvements	5.7	1.2	20.8	0.0
C.11	Alternative types transport	8.0	0.0	10.4	0.0
C.12	Strategies/Management programme	41.4	22.1	50.0	17.1
C.13	Performance against benchmarking	6.9	3.5	9.4	3.7
C.14	Board level responsibility	11.5	2.3	10.4	0.0
C.15	Employees incentives	3.4	1.2	7.3	0.0
C.16	Employees training	6.9	0.0	11.5	0.0
C.17	Supply chain involvement	10.3	0.0	20.8	2.4
C.18	Consumer training	5.7	0.0	1.0	1.2
C.19	Research sponsorship	16.1	2.3	8.3	6.1
C.20	Partnerships with external organisations	49.4	17.4	31.3	17.1
C.21	Carbon sequestration	6.9	2.3	3.1	0.0
C.22	Carbon offset	2.3	0.0	8.3	6.1
D	OTHER DISCLOSURE/NARRATIVE	85.1	57.0	93.8	48.8
D.1	Narrative	42.5	16.3	24.0	9.8

Table 5 – Descriptive statistics of scores for main four categories of disclosure

Score	Direct participants and standalone (n=87)	Direct participants and annual report (n=86)	Matched pair and standalone (n=96)	Matched pair and annual reports (n=82)
Mean (Standard Deviation)				
Basic score (max.4)	3.38 (0.77)	2.13 (1.03)	3.35 (0.79)	1.89 (0.90)
Additional' score (max. 25)	6.07 (3.42)	2.06 (1.68)	6.56 (3.29)	1.78 (1.86)
Total score (max.29)	9.45 (3.86)	4.19 (2.34)	9.92 (3.80)	3.67 (2.51)

Table 6 – Percentage of direct participants' reports providing main and sub-category disclosure

Indicator		Before UK ETS 2001/2002 (n=57)	UK ETS started 2002 (n=39)	After UK ETS 2003/2004 (n=77)
A	EMISSIONS	59.6	56.4	64.9
A.1	Emissions level	40.4	46.2	44.2
A.2	Indicators	24.6	17.9	23.4
B	TARGETS	56.1	53.8	51.9
C	ACTIONS	86.0	92.3	90.9
C.1	Use of new technologies	31.6	30.8	37.7
C.2	Redesigning products/process/services	22.8	25.6	24.7
C.3	GHG Certifications	0.0	0.0	0.0
C.4	Waste disposal	19.3	15.4	19.5
C.5	Energy conservation	43.9	35.9	45.5
C.6	Renewable energy	21.1	33.3	28.6
C.7	Energy and fuel efficiency	35.1	43.6	45.5
C.8	Refrigeration and air conditioning improvements	0.0	2.6	7.8
C.9	Travel reductions	5.3	7.7	5.2
C.10	Logistics improvements	0.0	2.6	6.5
C.11	Alternative types transport	7.0	0.0	3.9
C.12	Strategies/Management programme	29.8	30.8	33.8
C.13	Performance against benchmarking	7.0	2.6	5.2
C.14	Board level responsibility	3.5	0.0	13.0
C.15	Employees incentives	1.8	2.6	2.6
C.16	Employees training	3.5	2.6	3.9
C.17	Supply chain involvement	3.5	2.6	7.8

C.18	Consumer training	1.8	2.6	3.9
C.19	Research sponsorship	14.0	5.1	7.8
C.20	Partnerships with external organisations	24.6	17.9	48.1
C.21	Carbon sequestration	3.5	7.7	3.9
C.22	Carbon offset	1.8	0.0	1.3
D	OTHER DISCLOSURE/NARRATIVE	68.4	69.2	74.0
D.1	Narrative	28.1	20.5	35.1

Table 7 – Descriptive statistics of scores from direct participants’ reports per year

Score	Before UK ETS 2001/2002 (n=57)	UK ETS started 2002 (n=39)	After UK ETS 2003/2004 (n=77)
Mean (Standard Deviation)			
Basic score (max.4)	2.70 (1.03)	2.72 (1.21)	2.82 (1.10)
Additional score (max. 25)	3.74 (3.40)	3.56 (2.71)	4.58 (3.58)
Total score (max.29)	6.44 (4.14)	6.28 (3.61)	7.40 (4.36)

Appendix 1:

Coding instrument (*)

(Abbreviations: Greenhouse gases – GHG, Climate Change – CC and European Union - EU)

A- Emissions

A.1	Emissions level	Emissions levels on direct GHG (CO ₂ , SF ₆ , CH ₄ , HFC, PFC and N ₂ O), indirect GHG (CO, NO _x , SO ₂ and VOC) or other GHG and climate change potential (H ₂ , aerosol and clouds, H ₂ O and tropospheric O ₃).
A.2	Indicators	CO ₂ equivalent, Global Warming Potential and Global Warming Contribution.

B- Targets

B	Targets	Targets related to CC but not related to the direct participants in the UK ETS.
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C- Actions (**)

C.1	Use of new technologies	Use of new technologies to tackle CC.
C.2	Redesigning products/process/services	Redesigning products/process/services to tackle GHG emissions.
C.3	GHG Certifications	Certifications on CC (e.g.: ISO 14065).
C.4	Waste disposal	Monitoring of waste during the production process or at the end of the product life cycle.
C.5	Energy conservation	Reduction in energy consumption.
C.6	Renewable energy	Use of energy from renewable sources such as wind and solar.
C.7	Energy and fuel efficiency	Energy and fuel efficiency in order to tackle GHG emissions.
C.8	Refrigeration and air conditioning improvements	Improvements in refrigeration and air-conditioning to reduce GHG emissions.
C.9	Travel reductions	Reduction of travel made by managers and employees.
C.10	Logistics improvements	Improvements in logistics to reduce GHG emissions.
C.11	Alternative types transport	Use of alternative types of transport to reduce GHG emissions. Examples of alternative types of transport are hybrid or electric cars.
C.12	Strategies/Management	Management programme and strategies to reduce

	programme	CC. Implementation of internal strategies or management programmes to tackle GHG emissions.
C.13	Performance against benchmarking	Performance against internal and external benchmarking. Examples of possible benchmarking could be with regard to emissions levels and actions to tackle GHG emissions.
C.14	Board level responsibility	Board level responsibility. Specific area and/or personal responsibilities for CC issues.
C.15	Employees incentives	Example of employee incentives to award actions to reduce CC.
C.16	Employees training	Training employees on CC issues.
C.17	Supply chain involvement	Involvement of supply chain on the process to tackle GHG emissions.
C.18	Consumer training	Consumer information on CC issues.
C.19	Research sponsorship	Financing research on CC issues.
C.20	Partnerships with external organisations	Partnerships with external organisations to tackle GHG emissions.
C.21	Carbon sequestration	Reservoir to remove carbon emissions from the atmosphere.
C.22	Carbon offset	Purchase of carbon credits to compensate emissions.

D- Other disclosure/narrative

D.1	Narrative	The organisation states on rationale about CC.
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Coding procedure (***)

Disclosure on the category/sub-category scored as 1.

No disclosure on the category/sub-category scored as 0.

Total for 'basic' indicator	4 x 1	=	4
Total for 'additional' indicators	25 x 1	=	<u>25</u>
Total			29

(*) Adapted from de Aguiar & Fearfull (2010:75-77) and multiple greenhouse gas reporting guidelines (CDP, 2007; DEFRA, 2001, 2003, 2006; GRI, 2002, 2006; ISO, 2006; PCA, 2002; United Nations, 2004; WBCSD & WRI, 2004).

(**) Same categories and definitions used in de Aguiar & Fearfull (2010:75-77)

(***) Adapted from Soobaroyen & Ntim (2013).

Appendix 2: Key words on disclosure on climate change

- Emission
- Trading
- Greenhouse
- Gas
- Climate
- Global
- Warming
- Kyoto
- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFC)
- Perfluorocarbons (PFC)
- Sulphur Hexafluoride (SF₆)
- Water vapour (H₂O)
- Ozone (O₃)
- Carbon Monoxide (CO)
- Volatile Organic Compounds (VOC)
- Sulphur Dioxide (SO₂)
- Nitrogen Oxide (NO_x=NO+N₂O)
- Hydrogen (H₂)
- Aerosol
- Clouds

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NOTES:

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- ⁱ As background, the UK ETS was created by the UK Government, ahead of the European Union Emission Trading Scheme to explore how emissions trading could operate.

Participation in the UK ETS was voluntary with 32 organisations (called direct participants) taking part. It could be assumed, therefore, that those organisations that actively participated in the emissions trading were likely to be more aware of climate change issues and more likely to be able to measure (and hence report) their emissions data, among other things.

ⁱⁱ Indeed, an interview conducted by the National Audit Office with four direct participants (DuPont/Invista, Ineos Fluor, Rhodia and BP), identified that these organisations had implemented internal policies to reduce emissions well before the UK ETS was launched and that they felt the benefits of those initiatives in the first year of the scheme (NAO, 2004).

ⁱⁱⁱ See FTSE 500 ranking 2006 (<http://www.ft.com/reports/ft5002006/>).

^{iv} UK Listed Companies on the London Stock Exchange at 31/03/2006 - (<http://www.londonstockexchange.com/NR/rdonlyres/AA1BADA6-EEB0-469E-B20C-01A1B947194E/0/LISTDATEUKCOS.XLS>).

^v This database describes the largest 250,000 European companies by standardised annual accounting, financial rating, activities and ownership data.

^{vi} Corporate Register is a free directory of corporate social, sustainability, and environment reports from companies (www.CorporateRegister.com).

^{vii} Changes were needed to the research instrument in order to adapt it to analyse the impacts of the UK ETS on corporate disclosure. As an illustration, all categories and sub-categories that could reflect organisations' origin country, level of

internationalisation or activity sector were excluded (e.g., emissions by origin country, emission by sources or direct/indirect emissions). This was because the coding instrument seeks to build up a score of activities and hence categories and sub-categories that might not be equally applicable to a mixed group of organisations (such as direct participants and matched pair organisations) were excluded. In addition, all categories related to types of policy instruments were excluded due to the main objective of this research that is to analyzing the impact of the UK ETS in the disclosure. Narratives on climate change were considered as one category only. This was because the different types of narratives are sometimes opposing so it cannot be expected to have disclosure in all types of narrative as part of a score. However, it is expected an organisation to provide a narrative of some sort about climate change.

^{viii} For assessing reliability in content analysis, the literature recommends a random sample of 50 units or 10% of the full sample (Lombard, et al., 2002).

^{ix} While data spanned the date on which the UK ETS was implemented it proved impossible to undertake a statistical analysis of direct participants disclosures before and after the UK ETS implementation due to lack of sufficient data points for robust analysis. As a result, only a trend analysis is undertaken.

^x This total excludes organisations that only provided disclosure on actions/targets related to emissions trading in order to avoid biased results.