Convergence or divergence? Corporate climate-change reporting in China

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Abstract

Purpose – This study investigates the extent international and domestic guidelines have influenced the content of corporate environmental reporting in the context of China's radical institutional transition from bureaucratic secrecy to openness, marked by the first nationwide guidelines on Open Government Information (OGI) and Open Environment Information (OEI), effective in 2008.

Design - The study develops a research instrument that captures international and Chinese national guidelines pertaining to environmental information disclosure. This instrument is used to analyse 471 reports of leading 100 listed Chinese companies for the critical period between 2006 and 2010. Chi-square test statistics are used to analyse the significance of differences in reporting items supported by Chinese guidelines versus those supported by international reporting guidelines only.

Findings – Partial convergence in climate-change reporting co-exists with divergent China specific interpretation of climate change. The coercive institutional influences of the Chinese government's guidance in OGI and OEI led to the rapid growth of CER in 2008 compared to 2006, despite compliance being voluntary.

Originality/value – The study is innovative in explicitly measuring any changes in reporting relative to the potential for additional reporting. Such a method more accurately evaluates the effect of institutional influences on reporting. The study provides a fresh profile of the content and the reporting medium of CER, with a particular focus on climate change in the Chinese context. The findings highlight research into CER based on annual reports risks results being incomplete and misleading. Findings have practical implications for policy makers in other emerging economies.

Keywords: China; corporate climate-change reporting; developing country; institutional context; international; national

1. Introduction

Studies of corporate environmental reporting (CER) in developing countries, such as Bangladesh (Belal and Owen, 2007), South Africa (de Villiers and van Staden, 2006), and Lebanon (Jamali and Neville, 2011) reveal consistently that CER is subject to a country's political and economic context. This is despite the increasing global diffusion and harmonisation of reporting guidelines and practices. Hence, caution must be exercised when applying international reporting guidelines for CER to developing countries (Belal and Owen, 2007).

China, as the world's largest developing country, largest carbon emitter, and the second largest economy (after the United States), is playing an important role in global climate-change adaptation and mitigation. However, unlike other developing countries, China has a strong administrative capacity to formulate policies (e.g., on climate change) that are adapted especially to local conditions (Hubbard, 2008). China is a one-party state, in which the ruling Communist Party of China (CPC) is politically unchallengeable. Its influence on company behaviour in China (including with respect to CER) is acknowledged widely (Ezzamel et al., 2007; Ji et al., 2015; Lin, 2001; Yang et al., 2015). Thus, China's institutional context offers an insightful setting to investigate reporting behaviour (Scott, 2002). With the exception of the study by ACCA and GRI (2009), no empirical study has hitherto investigated the content of CER with a particular focus on climate change in China. This limitation is addressed in this study.

Before 2007, the lack of Chinese government guidance discouraged Chinese enterprises from engaging in CER. However, a study of Chinese CER by Yang et al. (2015, p. 35), reported 'the year 2008 was one of rapid growth of CER reporting' as the CPC's policy 'shifted from a preference for bureaucratic secrecy to one of openness and information transparency.' This was marked by the Chinese government's release of Open Government Information (OGI) and Open Environment Information (OEI), effective in 2008, and its encouragement of Corporate Social Responsibility (CSR) reports. While there is significant overlap between these guidelines and those commonly used internationally (e.g. GRI) the Chinese guidelines tend to be more general. This leads to a substantial number of more specific disclosure items in the international guidelines not being mentioned in the Chinese guidelines, hereafter referred to as items supported international guidelines only. However, there are also disclosure items that are unique to the Chinese context. In this study, the term 'supported by Chinese domestic guidelines' refers to both those instances where support is

solely from Chinese domestic guidelines and those instances where Chinese domestic guidelines and international guidelines converge (see Section 2.13).

China's institutional reform and push for environmental information transparency provides a timely opportunity to investigate the content and pattern of climate-change related environmental information disclosure. We do so here through a comprehensive analysis of such disclosures in Chinese companies' annual reports and CSR reports. Specifically, this study draws on institutional theory to investigate the impact of Chinese domestic guidelines (marked by OGI and OEI) on climate-change related environmental reporting in China. The following research question is addressed:

To what extent have Chinese guidelines and international guidelines influenced climate-change reporting by Chinese companies?

The relevance of institutional theory to CER is well documented in organisational study literature (e.g. Jennings and Zandbergen, 1995; Hoffman, 1999; Hoffman and Ventresca, 2002) and accounting literature (e.g. Larrinaga, 2007). Although institutional theory was developed in the West, an extensive review of literature on CER in China (see Yang et al., 2015) reveals it is a suitable framework to analyse Chinese CER. This is because of its ability to integrate China's unique institutional context with the individual circumstances of its companies. To date, some studies (such as by Branzei and Vertinsky, 2002; Yang, 2011; Zeng et al., 2012) have explicitly taken an institutional perspective when exploring Chinese corporate environmental management. However, no empirical study has examined the extent to which corporate climate-change related reporting has been influenced by China's institutional transition to information transparency, marked by OGI and OEI. This limitation is addressed here.

From 100 leading listed Chinese companies, 471 reports (annual reports and sustainability reports) across ten industries, were examined for the critical period from 2006 to 2010. We found that items supported by Chinese guidelines have a greater frequency of reporting than items supported by international guidelines only in each reporting year. However, when looking at the change in reporting, the gap narrowed for the period between 2008 and 2010, compared to that between 2006 and 2008. Such findings suggest partial convergence in climate-change reporting coexists with divergent specific interpretations of climate-change reporting by Chinese authorities.

This study extends the application of institutional theory to the analysis of CER in a developing country, specifically China. The study responds to the call by Scott (2002) and Yang et al. (2015) to examine studies on Chinese companies' behaviour (of which climate-change reporting is a part), informed by institutional theory. The study is among the first to use institutional theory to empirically examine the impact of institutional influences (domestic guidelines versus international guidelines) on changes in corporate disclosure of climate-change related environmental information over time. The empirical analysis conducted is innovative in explicitly recognising the corporate environmental information that has already been reported by companies, and in measuring any change in reporting relative to the potential for additional reporting. Such a method helps to evaluate the effect of institutional influences on corporate reporting more accurately. The findings strongly support the use of an institutional analytic framework to explain the convergence and the divergence in Chinese companies' responses to global and national institutional influences.

The study promotes a better understanding of specific institutional contexts companies face in dealing with climate-change issues. The study provides a fresh profile of the *content* and the reporting medium of CER, with a particular focus on climate change in the Chinese institutional context. The sample analysed is larger, richer (combined analysis of annual reports (AR) and (CSR) reports), and more current (including data for reporting year 2010) than previous studies on the climate-change reporting of Chinese companies by ACCA and GRI (2009). The findings of this study differ from that of ACCA and GRI (2009), which reported that the influence of country-level regulations and social pressures to levels of climate-change reporting was not related. This has two possible explanations, arising from the sample selection and research instrument. ACCA and GRI's study (2009) was drawn from nine CSR reports by Chinese companies in environmentally sensitive industries. The sample in this study was drawn from multiple industries, comprising 471 ARs and CSRs. ACCA and GRI (2009) used international reporting guidelines (GRI) to analyse the content of climate-change reporting practice. This study draws on a combined analysis of international and Chinese domestic guidelines on environmental reporting. Hence, unlike the report in ACCA and GRI (2009), the Chinese country-specific reporting environment has been captured in the research instrument and has been found to be a significant factor.

The study presents fresh findings on emerging trends in climate-change related environmental reporting by Chinese companies (e.g. assurance of CER reporting, the shift from using AR to CSR on climate-change reporting; source of income of climate-change activities). It highlights the probability that research findings based on sample data drawn

from AR only will be incomplete and misleading. The empirical approach including the research instrument developed should be useful for future researchers keen to investigate CER in China. This study also helps to inform policy makers in other developing countries who are wishing to develop CER (including climate-change) policies customised to their country's context.

The remainder of the paper is structured as follows: Section 2 reviews institutional theory and develops hypotheses. Section 3 presents the research method, Section 4 reports the results, and Section 5 discusses the results and concludes the study.

2. Theoretical framework

Institutional theory explains that a firm's actions are a result of a choice among 'a narrowly defined set of legitimate options' determined by institutional constituents/actors (e.g. government, market, regulators, industry associations, customers) comprising a firm's 'organisational field' of CER (Hoffman, 1999). The organisational field of climate-change reporting is evolving, and highly contextualised. Disparate institutional actors and individual companies interact in the field to develop 'collective' understanding of matters that are important to them (Lee, 2011, p. 287). The collective understanding shapes institutional logic in the field and influences the content of climate-change reporting. However, collective understanding is not necessarily unitary or coherent: organizations often confront multiple conflicting institutional pressures that bound the ability of organizations to conform (Oliver, 1991, p. 162).

Institutional theory examines external institutional pressures (including domestic and international) that lie beyond organisational boundaries, in social processes, and pressures for conformity that shape organizations' actions (DiMaggio and Powell, 1983; Oliver, 1997). Institutional pressures are composed of coercive (regulative), normative and mimetic (cognitive) elements. Coercive institutions result from formal and informal pressures exerted on organizations by other organizations, upon which they are dependent, and by cultural expectations in the society (both domestic and global) within which organizations operate (DiMaggio and Powell, 1983, p.150). Coercive institutions engage in rule-setting, monitoring, and sanctioning activities (Scott, 2002, p. 61). In the Chinese context, the CPC exercises coercive power through its control of the allocation of human and material resources; and through conferring legitimacy to Chinese companies. CPC leaders (an elite) can define appropriate organization structures and policy by changing political ideologies. The 'Scientific Approach to Development' (see Mohanty, 2003) has been cited as the guiding

ideology in China's significant domestic and international policy developments on climate-change, which created new institutions related to climate-change reporting. CPC's political ideology sets the premises, and defines the norms, of reporting by Chinese companies.

Normative institutions rely on mutually enforced prescriptions, obligations, and expectations (Scott, 2002, p. 61). They generally take the form of rules-of-thumb, standard operating procedures, occupational standards, and educational curricula. Organizations comply with them out of moral/ethical obligation or in conformance to norms established by universities, professional training institutions, and trade associations (Hoffman, 1999, p. 352). In China, many senior managers in large Chinese companies are former government officers, appointed by the CPC (Yang, et al., 2015, p. 32). Senior management who have affiliation with CPC membership are subject to the ongoing political screening of CPC party organisations. They must demonstrate their political loyalty and professional capability to maintain their management elite positions (Bian et al., 2001). They share a common history of developing their values and beliefs, and share an ongoing reinforcement of those values and beliefs through regular party members meeting, CPC party school training, and performance appraisal in the party organisations.

Mimetic (or cultural cognitive) aspects of institutions embody symbols—words, signs, and gestures—as well as cultural rules and frameworks. These guide understanding of the nature of reality and the frames through which meaning is developed (DiMaggio and Powell, 1983). Organizations will often abide by them without conscious thought. Mimetic institutional aspects form a culturally supported and conceptually correct basis of legitimacy that becomes unquestioned (Hoffman, 1999, p. 353). For example, since China's economic reform, modelling corporate behaviour on international business practice has become expected practice (Chen et al., 2007). Not following the legitimised course of action is likely to result in being perceived as less responsive or less effective. International consulting firms, global industry trade associations, supranational organizations, and global multinational companies explicitly diffuse reporting models across countries.

Organisations demonstrate structural and procedural isomorphism by responding to coercion, expectations of norms and imitation. Isomorphism is defined as 'a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions' (DiMaggio and Powell, 1983, p.149). The constraining process reflects the adaptation of an institutional practice by the organisation, in order to promote the survival and success of the organisation. However, a wide variety of institutional actors exert convergent and divergent institutional pressures on organisations in the organisational field.

This enables organisations to exercise agency and choice according to the organisations' circumstances (Levy and Rothenberg, 2002; Levy and Kolk, 2002; Oliver, 1991). For example, the study by Smith (2011) finds that factors characterise an organisation (e.g. for-profit versus not-for-profit, domestic versus global operation) result in different organisation's strategic response to corporate social responsibility. Thus, institutional theory accommodates firm-level agency interests in explaining the variations and changes in organisational responses to institutional pressures (Oliver, 1991; Scott, 2008).

To gain a better understanding of the organisational field, the following subsection 2.1 analyses the institutional context of corporate climate-change related environmental reporting in China.

2.1 Institutional analysis of climate-change reporting in China

2.11 China's policy response to climate change

China's international policy response to global climate change is linked closely to its domestic economic policies. These have focused strategies on adjusting the pattern of economic development and energy efficiency (China National Development and Reform Commission, hereafter NDRC, 2007). China signed the Kyoto Protocol in 1998. It became operative in China on 16 February 2005. In 2006, the central-state government set the first binding target to reduce energy consumption by 20 per cent and emissions by 15 per cent by 2010 (base year 2005) in its 11th Five-Year (2006–2010) National Social and Economic Development Program. In 2009, China announced its intent to cut emissions by 40 to 45 per cent by 2020. 'Energy Saving and Emission Reduction' became a slogan in government policy announcements on climate change issues. To achieve the set target, the Chinese government strengthened coercive pressures on companies and local governments. Business enterprises were required to account for energy usage and emissions and were subjected to regular audits of their progress in meeting set targets. Chinese large energy users were forced to sign contracts with the central government to improve energy efficiency, known as 'One Thousand Business Enterprises' Energy Saving Actions' (NDRC, 2006).

The 'National Plan on China's Response to Climate Change', published in 2007 by the NDRC (hereafter, the 2007 National Plan), stated that China's climate-change policy would give full effect to the CPC's political ideology of 'Scientific Approach of Development', promote the construction of a 'socialist harmonious society', advance the fundamental national policy of resource conservation and environmental protection, control greenhouse gas (GHG) emissions and enhance sustainable development capacity. The 2007 National Plan

outlined the principles guiding China's response to climate change. They included: operating in the global conceptual framework of sustainable development; taking common but differentiated responsibilities of the United Nations Framework Convention on Climate Change; emphasising mitigation and adaptation equally; relying on the advancement and innovation of science and technology; and participating in international cooperation actively and extensively (NDRC, 2007, p. 26). The majority of the policies and programs in the 2007 National Plan, and progress reports released annually from 2008 by the NDRC, refer to the direction of China's economic development in adapting to and mitigating climate change. Although climate change was not mentioned explicitly in China's domestic economic and environment policies, key domestic policies include those on energy saving and emission reduction, renewable energy, and environmental transparency. They promoted sustainable economic growth and reductions in GHG emissions (Lewis, 2007).

2.12 Increased domestic institutional pressures on CER in China

In response to growing domestic discontent with corruption and environmental pollution, the China State Council (2005) announced "Decisions on Implementing the 'Scientific Approach to Development' and Strengthening Environmental Protection" (hereafter, State Council Decision 2005). For the first time, environmental protection was placed high on the CPC's agenda. The Shenzhen Stock Exchange (SZSE) issued voluntary social responsibility reporting guidelines (including environmental reporting) in late 2006 (hereafter, the SZSE Guide 2006). The SZSE Guide 2006 drew strongly on the CPC's political ideology explicitly, as its guiding principle. Its intent was to model international best practice in corporate reporting.

The new institutional requirement for Chinese companies to report environmental information was affirmed by the central-state government's issuance of the first nationwide OGI in April 2007. High level central political support for information transparency has stimulated the implementation of the policy. China's Ministry of Environmental Protection was the first to implement OGI. Just days after the release of OGI, it issued OEI, China's first nationwide guidance on corporate environmental information disclosure. The measures specified in OEI were modelled closely on OGI, but the class of information made available was adapted for an environmental context (Finamore, 2010). In the same year, the China State-owned Assets Supervision and Administration Commission also issued guidance to central SOEs to fulfil their social responsibility (SASAC 2007). This document encouraged

central SOEs to report environmental information. In May 2008, the Shanghai Stock Exchange (SSE) issued guidelines on corporate social responsibility reporting for its listed companies (SSE 2008). SSE 2008 mirrored OEI on environmental reporting. In December 2009, the China Social Science Academy (a leading research institute funded by the Chinese government) published Chinese CSR guidelines (CASS 2010). This contained disclosure measures (including environmental information) that were similar to the Global Reporting Initiative (GRI) guidelines for sustainability reporting (G3).

Thus, between late 2006 and 2010, the Chinese central government, together with mainland stock exchanges and industry associations, exerted convergent institutional influences on Chinese companies regarding environmental disclosure through CSR reporting (see Table 1). In general, these guidelines were consistent with international guidelines on CER including climate change (although frequently less specific). However, there were some divergent measures for specific environmental information disclosures. This leads to the following analysis of the convergence and divergence between global guidelines and Chinese guidelines on environmental information disclosure pertaining to climate-change.

2.13 Convergence versus divergence between international guidelines and Chinese guidelines

International guidelines and Chinese domestic guidelines can diverge or converge, depending on the specific reporting item. Table 2 summarises the commonalities (convergence) and differences (divergence). It shows the supporting international reporting guidelines and the Chinese domestic reporting guidelines for corporate climate-change related environmental information disclosure.

Insert Table 2 about here

The sources for developing Table 2 (the research instrument to be used for content analysis in this study) incorporate international studies, environmental and climate-change related reporting guidelines (World Resources Institute and the World Business Council for Sustainable Development, 2004; Global Reporting Initiative (G3), 2006; Global Compact, 2011; KPMG and GRI, 2007; Carbon Disclosure Project, 2009; ACCA and GRI, 2009) and China's domestic guidelines on environmental reporting (see Table 1).

The research instrument comprises 38 individual disclosure items, grouped into the six categories of general disclosure shown in Table 2: policy; governance and strategy; financial

implications and other risks and/or opportunities; performance and targets; climate change mitigation; and adaptation and credibility. Table 2 documents the link between the disclosure items and Chinese guidelines (CN) and international guidelines (INT). The table shows that the instrument has three items that align with Chinese guidelines only, 16 items that align with both Chinese and international guidelines, and 19 items that align with international guidelines only.

The 'policy' disclosure category relates to environmental policies that define an organisation's overall commitment to the compliance, operation (including energy and materials), product impact and approach to binding targets. Content analysis of key Chinese reporting guidelines reveals the CPC's political ideology of a 'Scientific approach to development' is the driving force behind the release of these documents. The Chinese government's response to climate change is related closely to its economic policies and 'energy saving and emissions reduction' campaigns. Chinese domestic environmental reporting guidelines do not mention climate change explicitly.

The 'governance and strategy' disclosure category is concerned with how companies manage information disclosure on climate change (or energy saving and emission reduction also covers whether the organisation has explained how climate change trends are aligned and integrated with future business strategies (ACCA and GRI, 2009). Unlike international reporting guidelines, which suggest reporting specific information in this category, Chinese guidelines do not explicitly mention anything in this category. An exception is a brief statement in SZSE 2006 (Art. 27) that companies should appoint staff to be responsible for environmental protection and provide resources to support those staff. However, the OEI encourages Chinese enterprises to disclose environmental information voluntarily, as is appropriate to the enterprise. In addition, Chinese listed companies are required to provide information about general corporate governance and strategy in their annual financial reports. With increased Chinese government regulations on environmental protection, some disclosure in this category is expected.

The 'financial implications and other risks and/or opportunities' disclosure category is concerned with the risks and/or opportunities associated with climate change. It covers physical risks (e.g. extreme weather and storms) and regulatory risks (e.g. increased compliance costs due to the impact of new government regulations). Also included are opportunities to provide products using new technologies, or services to address climate change, potential competitive advantages created by regulatory or technological changes linked to climate change, income specifically related to environmental protection, and carbon

emissions trading. Except for recommended voluntary reporting of regulatory risks associated with new government environmental regulations, Chinese domestic guidelines do not explicitly mention physical risks and opportunities associated with climate change.

The 'performance and targets' disclosure category is concerned with company energy consumption and emissions, targets to reduce energy consumption and emissions, the results of proactivity to improve energy-efficiency and emissions reduction, and the fines or sanctions for non-compliance. Except for a general statement on environmental performance and targets (including energy saving and emissions reduction), Chinese domestic reporting guidelines do not distinguish energy consumption based on source, and direct or indirect consumption, as do international reporting guidelines.

The 'mitigation and adaptation' disclosure category is concerned with actions a company has taken to deal with climate change. China's National Plan 2007 points out that for developing countries 'mitigation is a long and arduous challenge while adaptation to climate change is a more present and imminent task' and 'China will strengthen its policy guidance for energy conservation and energy structure optimization to make efforts to control its greenhouse gas emissions' (p. 26). China's policy statement on mitigation and adaptation to climate change indicates (while recognising mitigation actions are essential to cope with climate change) that China's response to climate change aligns with adaptation rather than mitigation. Practical measures to mitigate and adapt to climate change in China are effected through implementation of national social and economic policies, with particular focus on energy efficiency and emissions reduction. China's domestic policy emphasizes innovation and technology (including investment in research and development in environmental technologies and product innovation; and education and training) in the campaign for energy efficiency and emission reduction. Hence, mitigation and adaptation actions are grouped into one category as in ACCA and GRI (2009). Except for items 29 and 32, which are aligned more with international reporting guidelines, other specific reporting items under this category are convergent between the Chinese domestic reporting guidelines and the international guidelines.

The 'credibility' disclosure category is concerned with the integrity and credibility of a company's reporting. There is no specific guidance on the credibility of environmental reporting in Chinese domestic guidelines. This contrasts with the international guidelines (e.g. GRI 2006) which suggest disclosure of the details of independent assurance of reporting and whether national or international reporting guidelines are used. However, Chinese domestic

guidelines do encourage companies to report awards received for environmental protection and pollution control activities voluntarily (e.g. in SSE 2008).

2.2 Hypothesis development

Institutional theorists argue that the coercive, normative and mimetic aspects of institutions are integrated and difficult to distinguish empirically, however each of these aspects can be more influential than others at certain points in time (Hoffman, 1999; Scott, 2008; Unerman and Bennett, 2004). Coercive institutions are more powerful than other institutions in the early stage of defining institutional logic in an organisational field. They force organisations to conform to institutional pressures (Oliver, 1991). New forms of debate (e.g. environmental information transparency in China) emerge in the wake of triggering events (e.g. OGI and OEI) that reconfigure field membership and/or interaction patterns (Hoffman, 1999). The increased coercive pressures exerted by politically and economically powerful stakeholders stimulate normative and mimetic institutional pressures on a firm. Therefore, they result 'both in many companies adopting similar stakeholder dialogue procedures, and the standard gradually increasing for so long as managers of these companies perceive there to be a competitive advantage in being seen to engage in widespread stakeholder dialogue' (Unerman and Bennett, 2004, p. 692). Tauringana and Chithame (2015) and Yang et al. (2015) lend strong support to institutional theorists' view that pressures exerted by coercive institutional actors can stimulate converging normative and mimetic aspects of institutions in the field of climate-change reporting − especially in the early stage of forming new institution (e.g. corporate climate-change reporting). Similarly, Hogan and Lodhia (2011) point to the need for regulating corporate carbon emission reporting because reporting through regulatory mechanisms (i.e. coercive institutions) has the potential to be credible. This helps companies to better 'manage their reputational risk and portray to stakeholders their commitment to environmental responsibility' (pp. 282 - 283).

The major coercive institutional pressures were domestic during the period between 2006 and 2010. The central political commitment of CPC leaders to OGI and OEI has influenced policy and practice in Chinese enterprises (Horsley, 2007). They create imperatives for Chinese companies to conform to the expectations set by the CPC. The increased interest of the CPC and the Chinese government in corporate environmental information transparency would affirm the extant normative and mimetic (cognitive) institutional influences at international and national levels. Hence, the Chinese guidelines are

expected to be more influential than the international guidelines on the change in company reporting behaviour.

Consistent with institutional theory (e.g. Oliver, 1991), when there is a convergent interpretation of climate-change related reporting in the international and the national guidelines, the propensity to report is expected to even higher. In contrast, when there is a divergent interpretation of climate change in the international and national reporting guidelines (i.e. reporting items supported by international guidelines only) firms will respond strategically to such divergence, by exercising agency and choice. Reporting levels by individual Chinese companies can differ due to individual company's circumstances (e.g. company characteristics).

Given OGI and OEI only became effective since 2008, the above discussion leads to the following hypothesis.

Hypothesis 1 (H1): There will be greater reporting of environmental information disclosure supported by Chinese guidelines in 2008 and 2010 than those supported by international guidelines only.

A recent empirical study in UK by Tauringana and Chithame (2015) found a coercive institutional influence — The UK government's guidance on corporate climate change improving the level of climate-change reporting by UK companies. This suggests that the impact of the coercive forces flowing from the triggering event of the Chinese government's introduction of OGI and OEI should have an immediate impact on the shift towards to the reporting of items supported by the Chinese guidelines. Consistent with institutional theory, when a new institution is formed, the initial impact of the coercive institutional pressures will be followed by a lesser impact of the normative and mimetic institutional influences. Hence, we expect there will be continued shift towards the reporting of items supported by Chinese guidelines in later years, but at a lower rate of change than initially.

Hypothesis 2 (H2): Following the implementation of OGI and OEI, there will be greater improvement in the reporting of environmental information supported by Chinese guidelines than those supported by international guidelines only, with the rate of improvement lessening over time.

3. Research method

3.1 Data and study period

Data analysed are the annual reports (AR) and corporate social responsibility reports (CSR) of the 100 leading companies across ten industries listed on the China Securities Index (CSI) 100 on 30 December 2007 from China's SSE and SZSE. 471 reports are analysed. Standalone CSRs were downloaded from company websites. Table 3 provides a summary of reports analysed.

Insert Table 3 about here

Reports for three significant reporting years were analysed: 2006, 2008 and 2010:

- 2006 was the beginning year of China's 11th Five-Year Development Program. At this time there were no national level corporate voluntary reporting guidelines.
- 2008 was the year the Chinese government's OGI and OEI both became effective.
- 2010 was two years after the effective implementation of the OGI and OEI. It allows sufficient time for Chinese companies to embed national guidelines in their reporting. It was also the final year of the 11th Five-Year Development program.

3.2 Empirical analysis

The research objective is to examine the extent to which international guidelines and domestic guidelines have affected the pattern of Chinese company climate-change reporting. We analyse whether there are different frequencies (and/or changes in the frequencies) of reporting, of items that were supported by Chinese guidelines, and those supported by international guidelines only. Data are grouped into two categories. One is the frequency of reporting items supported by Chinese guidelines (CN), and the other is the frequency of reporting items supported by international guidelines only (INT). A contingency table approach, using a chi-square test, is appropriate for this categorical data analysis (Stockburger, 2016).

Chi-square tests are used to assess the significance of any difference in the frequency of reporting items supported by Chinese guidelines and those supported by international guidelines only, in 2008 and 2010 (H1). Those tests were used also to assess the significance of changes in the frequency of reporting items supported by Chinese guidelines and those supported by international guidelines only over time (H2).

The commonly used approach (e.g. KPMG and GRI, 2007) to measure the change in reporting over time is to calculate the absolute percentage growth in reporting items over time

and to test whether the rates of growth in the reporting items differ significantly over the same time periods. Because the potential for growth in reporting differs substantially across individual reporting items under different categories, the commonly used approach risks severely distorting the analysis. Any category that starts from a low initial base of reporting has much greater potential for increase than one that already has a relatively higher level of initial reporting. To recognise this, the relative change in the reporting compared to the potential for further growth in reporting is the key measure. To analyse the relative change in the frequency of reporting of items supported by Chinese guidelines versus those supported by international reporting guidelines only, it is important to recognise how many items are being reported already, or conversely, to assess the potential for further reporting. Any change in reporting should be measured relative to the potential for additional reporting, to avoid distorting the analysis.

The following definitions recognise that the potential to increase reporting is given by the maximum possible number of items that could be reported minus the number already being reported. This yields the relationships below:

INT_t: items reported in time period t that are supported by international reporting guidelines only

$MINT_t$: the maximum number of items that could have been reported in time period t that are supported by international reporting guidelines only.

$\Delta INT_{t,\ t+1}$: the percentage change between periods t and $t+1$ in the number of items reported that are supported by international reporting guidelines only, relative to the maximum possible change that could have occurred between periods t and $t+1$in the same set of items

CN_t : items reported in time period t that are supported by Chinese reporting guidelines

MCN_t: the maximum number of items that could have been reported in time period t supported by Chinese reporting guidelines

$\Delta CN_{t,\ t+1}$: the percentage change between periods *t* and *t+1* in the number of items reported that are supported by Chinese guidelines relative to the maximum possible change that could have occurred between periods *t* and *t+1*in the same set of items.

$$\Delta INT_{t,\ t+1} = (INT_{t+1} - INT_t)/(MINT_{t+1} - INT_t)*100$$

$$\Delta CN_{t,\ t+1} = (CN_{t+1} - CN_t)/(MCN_{t+1} - CN_t)*100$$

Additionally, the absolute percentage growth in each category over time was used to measure the impact of institutional influences over time. This analysis investigated whether the results are altered (or distorted) in the absence of adjustment to the potential for increase in reporting.

4. Results

4.1 Change in reporting content over time

Content analysis reveals a distinctive Chinese environment of climate-change reporting in categories of policy, governance and strategy, financial implications and other risks/opportunities, performance and targets, mitigation and adaptation, and credibility. Table 4 summarises the changes in overall and in category disclosure over time.

Insert Table 4 about here

Table 4 shows that the general disclosure category, Policy, has the highest disclosure incidence across each of the three observation years. This is followed by Mitigation and Adaptation, Credibility, Performance and Targets, Governance and Strategy. The lowest disclosure is for Financial Implications and Other Risks/Opportunities. In general, this reporting pattern is consistent with international studies on corporate climate-change reporting (ACCA and GRI, 2009; Freedman and Jaggi, 2005; KPMG and GRI, 2007).

A closer examination of the specific disclosure items in each general category shows signs of both convergence and divergence with international climate-change reporting practice across years, and across companies, in any given year. Nonetheless, results reflect climate-change reporting in China's country-specific reporting context. Table 5 presents the findings of individual reporting items disclosed by AR only, CSR only, and both AR and

CSR (hereafter AC). This enhances the understanding of changes in reporting in each category by disclosure medium over time.

Insert Table 5 about here

4.2 Influence of international guidelines versus Chinese guidelines on reporting

Table 6 summarises the explicit mentions of reporting guidelines (i.e. research instrument item 37) by the sample companies

Insert Table 6 about here

Table 7 presents the reporting frequency, and the change in potential additional climate-change reporting items, supported by international guidelines only (INT, n=19) and Chinese guidelines (CN, n=19) between 2006 and 2010.

Insert Table 7 about here

Table 7 shows that the maximum number of possible reporting items in any year, is the same in the two categories. However, in descriptive terms, there is a greater level of actual reporting of items supported by Chinese guidelines than by items supported only by international guidelines. In terms of the reporting over the time period, the data show a large jump in reporting between 2006 and 2008. This is much higher in items supported by Chinese guidelines (48%) than items supported only by international guidelines (21%) when adjusted for the potential for increases. There is a lower level of increase between 2008 and 2010 (15% and 6% respectively), but again a similar pattern between the two categories.

Between the two categories, all reporting levels within each year, and changes between years, are statistically different at the 1% level. This allows us to accept that there are statistically significant higher levels of reporting of items supported by Chinese guidelines than by only international guidelines within each year. We can also accept that the rate of increases between the years is higher for items supported by Chinese guidelines. Thus, H1 and H2 are supported.

Additional analysis, using an alternative approach to examine the change in the frequency of reporting over time (i.e. without adjustment for the potential for increases),

reveals a conflicting result. This finding provides support for our argument that any change in reporting should be measured relative to the potential for additional reporting.

5. Discussion and conclusion

5.1 Convergence and divergence in the content of climate-change reporting

This study strongly supports the greater influence of Chinese country-level reporting guidelines compared to international guidelines regarding the content of corporate climate-change reporting. It supports that the ruling CPC has had a pervasive influence on Chinese company reporting behaviour. Findings of the study validate that the strong administrative capacity of the Chinese government in dealing with climate-change issues, by means of administrative and market mechanisms has pushed Chinese companies to commit to energy savings and emissions reduction. The results reveal a strong domestic guideline influence in 2008, with a further, but lesser additional influence in 2010, following the introduction of OGI and OEI. The institutional change of environmental information, marked by the implementation of OGI and OEI in China, has stimulated a greater level of reporting of climate-change related information mentioned in international guidelines. Where a reporting item was specified in Chinese domestic reporting guidelines, the item had a greater level of disclosure than if specified in international guidelines only. From 2006 to 2010 there was also greater alignment with international guidelines, but not to the same extent as with Chinese guidelines. The findings lend support to the proposition that a country's institutional context shapes the content of disclosure (Escobar and Vredenburg, 2011; Holland and Boon Foo, 2003; Williams, 1999).

The reporting of the 'policy' category corresponds to China's domestic policy response to climate change. There are consistently high levels of reporting of the CPC's political ideology of 'scientific development' (item 1), 'energy saving and emission reduction' (item 3), 'sustainable development' (item 5), and 'harmonious society (item 6)', especially in contrast with the lower level of reporting on 'climate-change or global warming (item 2)'. A majority of companies reported a position of support for the Chinese government's environmental policy. They stated that they were committed to binding targets of 'energy saving and emissions reduction'. This is consistent with the high levels of disclosure of item 3, as opposed to low levels of explicit disclosure of 'climate change'. This result supports the institutional theoretical argument about firm's strategic response to the divergent pressures exerted by the international guidelines and the national guidelines. The Chinese government's domestic policy response to climate change was to implement a national policy of 'energy

saving and emissions reduction' and industry restructure. 'Climate change' is not mentioned explicitly in environmental reporting guidelines issued by the Chinese government or stock exchanges. In the absence of clear guidance from the state on reporting on 'climate change', many companies chose not to mention 'climate change' in their reports. This is because low disclosure of the item 'climate change' would not pose any immediate threat to legitimacy. This finding differs from international studies by KPMG and GRI (2007), and by ACCA and GRI (2009). Most international companies surveyed in these studies mentioned 'climate change' explicitly in their reports, and higher levels of disclosure of executives' views on 'climate change'.

From 2006 to 2010, there was a changing pattern of reporting for the category 'risks and opportunities.' Reporting more about opportunities than about risks associated with 'energy saving and emission reduction' can be explained, in part, by the incentives provided by the Chinese government to Chinese companies, through a designated 'energy saving and emission reduction subsidy'. This is evidenced by consistent growth in reporting of item 18 (income associated with climate change and environmental protection activities). This reporting disclosed that the major source of income is the Chinese government's 'energy saving and emission reduction subsidy'. This differs from the findings of KPMG and GRI (2007) that reported income by Western companies was sourced from savings from reductions in energy use and emissions, and from trading carbon credits. This finding strongly supports the influence of the different economic institutional environment in which Chinese and Western companies operate. It indicates a still-prevailing administrative role for the Chinese government as a resource provider for Chinese companies in mitigating and adapting to climate change. The findings differ from those in developed countries, where market mechanisms are drawn on more than administrative tools in generating income associated with environmental protection activities.

The findings indicate that early movers began to take advantage of the commercial benefits arising from the global and Chinese domestic emissions trading markets. Compared to reporting in 2006 and 2008, in 2010 there are statistically significant increases in reporting of 'climate change' (item 2), 'low carbon economy' (item 4), 'information about how climate-change trends are linked to future company strategy' (item 13), 'income specifically related to environmental protection activities' (item 18), 'carbon emission trading' (item 19), 'purchase energy from low carbon sources' (item 32) and 'renewable energy' (item 33). Reporting of 'carbon emission trading' emerges in 2010, despite low levels of reporting of this item in 2006 and 2008. This change of reporting indicates the growing international

influences on Chinese company reporting behavior, resulting from the rapid internationalization of Chinese companies (see Yang et al., 2015). The growing interactions between Chinese companies and the international market impel Chinese companies to be perceived as legitimate organisations by international stakeholders. Reporting of climate-change related environmental information (aligned with international reporting guidelines) is a means by which Chinese companies establish their legitimacy in international markets. The global expansion of Chinese companies will continue in the next decade. Hence, a greater alignment of Chinese companies' climate-change reporting with international guidelines is expected in the future.

A high disclosure level was found in the 'mitigation and adaptation' category, where most reporting items are common to Chinese national guidelines and international guidelines. This is consistent with our theoretical argument that the greatest propensity to report coincides with items where Chinese and international guidelines align. High reporting levels of information about 'energy saved and emissions reduced', 'mitigation and adaptation actions', 'awards', and under reporting of 'fines or sanctions for non-compliance', suggest companies tend to send positive messages to report recipients. This is consistent with the findings of international studies on climate-change reporting based in developed countries (ACCA and GRI, 2009; Freedman and Jaggi, 2005; KPMG and GRI, 2007). High levels of reporting in this area suggest convergent interpretations of climate-change mitigation and adaptation actions from institutional constituents at the organisational field increase the propensity to report by Chinese companies. It symbolises Chinese companies' conformance with the Chinese government's domestic policy of climate-change through implementing an 'energy saving and emissions reduction' campaign, as well as meeting international stakeholder expectations on climate-change mitigation and adaptation.

In general, there were lower levels of disclosure in the categories 'financial implications and other risks/opportunities' and 'performance and targets'. The low levels of disclosure of risks indicate Chinese companies are still uncertain about how to define the risks or the consequences of reporting risks. Therefore, they are not yet prepared to recognise the potential risks associated with climate change. The low reporting of most information in the category 'performance and targets', both within China and internationally, suggests the technical challenge of accurately measuring quantities of energy use and emissions.

Although a low level of independent assurance (see Item 36, Table 5) was found, reporting of this information increased over time, consistent with the trend in international studies. Nonetheless, the percentage of Chinese companies is much lower than international

studies: for example, only 12 per cent of the sample companies disclosed external assurance of CSR reports in 2008, in contrast to nearly 40% of global companies reporting external assurance in 2003 (see O'Dwyer and Owen, 2007). Among the few companies that included an external assurance report, there was great disparity with regard to providers of assurance and approaches to assurance, consistent with international studies (see O'Dwyer and Owen, 2007). Some sample companies (e.g. China Citic Bank; Pingan Insurance, and Merchant Energy Shipping) used international consulting firms based in China (such as Ernst and Young, DNV Certification China, and Lloyd's Register Quality Assurance) to perform the assurance service. International assurance guidelines including AccountAbility's AA 1000 assurance standards and ISAE 3000 were used. In contrast, some companies (e.g. China Minsheng Banking and Shanxi Taigang Stainless Steel) issued a statement by the director of the Chinese national business association or a Chinese local journal, WTO Journal, commenting on their CSR reports. In these instances, no specific information was given on how the assurance was provided. This is the first finding about the assurance of Chinese CSR reports. It has implications for future policy development and research.

The low levels of reporting in some areas (financial implications of risks associated with climate change; quantitative information of targets of energy efficiency and emission reduction; and independent assurance of climate-change related environmental reporting) require more extensive government guidelines, including further development of general financial reporting standards. As Dascalu et al (2010) argued, a 'sustainable economy' requires a 'framework for the economic policy based on the ecological principles within the global warming context' (p. 20). In the absence of 'cost information about climate change', even 'sophisticated users with expertise in analysing financial statements' will have problems understanding the impact of climate change on company performance (Freedman and Jaggi, 2005, pp. 228–229).

This study highlights the usefulness of applying an institutional theoretical framework to examine the convergence versus divergence of corporate climate-change reporting behaviour in China (and possibly in other developing countries). Results reveal 'legitimacy is a relative concept; it is relative to the social system in which the entity operates and is time and place specific' (Deegan, 2009, p. 324). To the extent that there is similarity in the reporting pattern across companies within each year, and over time, during the three observation years, this reflects the convergent institutional influences on Chinese companies. To the extent that there is variation in the reporting pattern across companies over time during the three observation years, this reflects the changing political and economic

environment and divergent institutional interpretations to climate change. Any individual company can choose to 'avoid' or 'manipulate' the content of reporting when there are divergent institutions in the organisational field (Oliver, 1991).

5.2 Limitations and directions for future research

This study draws data from ARs and CSR reports. Future research could extend data collection to other reporting media (e.g. websites). Reporting periods after the study period (2006 - 2010) could be covered in future research to assess the impact of changes in global institutions and the increased international operation of Chinese companies. Despite these limitations, this study has made positive theoretical and empirical contributions to climate-change reporting research in China.

Findings of this study point to further new research questions: What is the future development of corporate climate-change reporting in China and other BRICS (Brazil, Russia, India, China and South Africa) nations? The BRICS nations are becoming more important in the global negotiation on climate change. They are facing similar competing priorities to develop economy and carbon emission reduction. The fact that developed countries transfer their polluting activities towards the BRICS nations (see Biotier, 2012) complicates the international negotiation on carbon emission reduction. This is because a substantial amount of carbon emissions in BRICS nations are caused by manufacturing products that are consumed in the developed countries. A recent report by Liu (2015) shows about 25% of China's carbon emissions are caused by making products exported to the developed countries. Therefore, how to fairly share the responsibility of carbon emission reduction between the developed countries and the BRICS nations? To what extent climate-change mitigation policies currently used by developed countries (e.g. the European Union's Emission Trading Scheme) would be effective in achieving the global carbon emission reduction? How do multinational companies (with head-quarters based in the developed countries) report their environmental activities in BRICS (and other developing) countries?

Findings of this study highlight research into CER based on samples drawn from annual reports risks results being incomplete and misleading. Future research should investigate how can we best integrate ARs and CSR Reports in corporate climate-change reporting? How accounting can best assist decision makers in integrating climate-change information with conventional financial reporting (see Alewine and Stone, 2013)?

This study raises the question of how can we ensure the credibility of reporting? Findings of the study indicate assurance of the reporting of climate-change related environmental

information is in its infancy in China. There is an urgent need for internationally and domestically convergent guidelines for assurance providers regarding the measures of independent assurance of climate-change related environmental (and CSR) information. At present, there are no Chinese national guidelines for such information. Even internationally, there are different assurance guidelines with differing approaches to the assurance of corporate sustainability reporting. Without compatible international and domestic guidelines for information about who should (and how to) perform independent assurance of climate-change related environmental reporting, the credibility of such reporting will be compromised.

With China's growing contribution to the world economy, and the urgent need to develop a global solution to climate change involving collective efforts from developed and developing countries, future development of international reporting guidelines on corporate reporting (including climate-change related environmental information) should engage with Chinese companies so that international reporting guidelines can be better adapted to the Chinese environmental reporting context.

Table 1 Chinese CSR reporting guidelines

China State Council (2005): Decisions on implementing the scientific approach to developing and strengthening environmental protection (the 2005 Decision)
Shenzhen Stock Exchange (2006): Corporate social responsibility guide for companies listed on Shenzhen Stock Exchange (SZSE 2006)
China Ministry of Environmental Protection (2007): Measures for open environmental information disclosure (for trial implementation) (OEI)
China state-owned Assets Supervision and Administration Commission (2007): Guidance on central-SOEs to fulfil social responsibility (SASAC 2007)
Shanghai Stock Exchange: Guidelines on voluntary disclosure of corporate social responsibility and environmental information (SSE 2008)
China Social Science Academy (2010): Corporate social responsibility reporting guidelines (CASS 2010)

Table 2 Research instrument

General Disclosure	Item	Specific Disclosure	CN	INT
Policy	1	Mention of 'scientific development'	YES	NO
	2	Mention of 'climate change or global warming'	NO	YES
	3	Mention of 'energy saving and emissions reduction'	YES	YES
	4	Mention of 'low carbon economy'	YES	YES
	5	Mention of 'sustainable development'	YES	YES
	6	Mention of 'harmonious society'	YES	NO
	7	Policy statement on operations and environmental protection	YES	YES
	8	Public position on commitment to binding targets (e.g. support the government's call for emissions reduction and energy saving)	NO	YES
	9	Policy on addressing product impacts	NO	YES
Governance and Strategy	10	CEO/Directors articulate views on environmental protection, and energy saving and emission reduction	NO	YES
	11	Existence of a board committee with specific responsibility for environmental affairs/energy saving and emission reduction	NO	YES
	12	Remuneration at executive and board level is linked to energy saving and emission reduction	NO	YES
	13	Information about how climate change trends are linked into future company strategy	NO	YES
Financial	14	Risks due to physical changes associated with climate change	NO	YES
Implications and other risks/opportunities	15	Regulatory risks	YES	YES
	16	Opportunities to provide new technologies, products or services to address challenges related to climate change	NO	YES
	17	Potential competitive advantage created for the organisation by regulatory or other technology changes linked to climate change	NO	YES
	18	Income specifically related to environmental protection activities	NO	YES
	19	Carbon emissions trading	NO	YES
Performance and Targets	20	Quantified energy use	YES	YES
	21	Quantified GHG emissions	NO	YES
	22	Targets to reduce energy use	NO	YES
	23	Targets to reduce emissions efficiency	NO	YES
	24	Energy saved and emissions reduction achieved	YES	YES
	25	Fines or sanctions for non-compliance	YES	YES
Mitigation and Adaptation	26	R&D	YES	YES
	27	Install cleaner/new technologies	YES	YES
	28	Education and training	YES	YES
	29	External certification of environmental management	NO	YES
	30	Energy efficiency measures	YES	YES
	31	Product innovation and change	YES	YES
	32	Purchase energy from low carbon sources	NO	YES
	33	Renewable energy	YES	YES
	34	New business model	YES	YES
	35	Relocation/restructure	YES	YES
Credibility	36	Independent assurance of disclosure	NO	YES
	37	Use of national/international guidelines to report environmental performance	NO	YES
	38	Awards	YES	NO

Table 3 Summary of reports analysed

Industry	**2006**		**2008**		**2010**		**Total**
	AR	CSR	AR	CSR	AR	CSR	
Consumer Discretionary	12	1	12	8	12	9	54
Consumer Staples	7	1	7	3	7	4	29
Energy	9	2	9	7	9	7	43
Financial-banking	10	2	10	10	10	10	52
Financials-non-banking (including real estate, insurances and securities)	9	1	9	6	9	8	42
Industrial-Transportation	14	0	14	11	14	11	64
Industrial-Capital Goods	4	1	4	3	4	3	19
Materials	18	3	18	15	17	15	86
Utilities (including Telecoms)	14	0	14	12	14	12	66
Others (including Heath Care and Information Technology)	3	1	3	3	3	3	16
Total	**100**	**12**	**100**	**78**	**99**	**82**	**471**

Table 4 Change in overall and category disclosure over time

[Key: ADF: Actual disclosure frequency; % MDF: the percentage of maximum possible disclosure frequency in the category]

	2006		**2008**		**2010**	
Category disclosure	ADF	% MDF	ADF	%MDF	ADF	%MDF
Policy	177	20%	557	62%	631	71%
Governance and strategy	19	5%	99	25%	117	30%
Financial implications and other risks/opportunities	24	4%	79	13%	116	20%
Performance and targets	21	4%	176	29%	166	28%
Mitigation and adaptation	79	8%	459	46%	531	54%
Credibility	19	6%	129	43%	146	49%
Total disclosure	**339**	**9%**	**1499**	**39%**	**1707**	**45%**

Table 5 Change in individual item disclosure over time

[Key: Cat1= Policy; Cat2=Governance and Strategy; Cat3= Financial implications and other risks and opportunities; Cat4=Performance and targets; Cat5=Mitigation and adaptation; Cat6=Credibility; %]

	2006 (n=100)				**2008 (n=100)**				**2010 (n=99)**			
	AR only	CSR only	AC	**Overall**	AR only	CSR only	AC	**Overall**	AR only	CSR only	AC	**Overall**
Cat 1												
1	25	4	3	**32**	18	15	41	**74**	22	16	33	**71**
2	1	3	0	**4**	2	5	8	**15**	3	25	2	**30**
3	18	5	4	**27**	16	13	62	**91**	12	22	57	**91**
4	0	0	1	**1**	0	2	2	**4**	9	26	31	**66**
5	31	1	7	**39**	17	10	66	**93**	12	15	61	**88**
6	19	2	9	**30**	7	20	55	**82**	3	45	32	**80**
7	9	6	2	**17**	4	22	51	**77**	4	39	38	**81**
8	13	7	3	**23**	8	16	53	**77**	7	39	37	**83**
9	0	3	1	**4**	4	7	33	**44**	1	25	15	**41**
Cat 2												
10	6	3	1	**10**	9	9	33	**51**	8	24	20	**52**
11	1	4	1	**6**	4	8	15	**27**	1	16	7	**24**
12	0	0	0	**0**	1	1	4	**6**	0	1	3	**4**
13	1	2	0	**3**	2	4	9	**15**	7	22	8	**37**
Cat 3												
14	0	1	0	**1**	1	1	4	**6**	3	2	0	**5**
15	10	0	0	**10**	13	0	3	**16**	16	1	2	**19**
16	0	0	0	**0**	4	3	7	**14**	6	10	6	**22**
17	4	0	0	**4**	3	3	2	**8**	0	6	4	**10**
18	3	5	0	**8**	13	2	16	**31**	21	11	17	**49**
19	0	0	1	**1**	0	0	4	**4**	1	8	2	**11**
Cat 4												
20	0	3	1	**4**	1	13	25	**39**	0	29	8	**37**
21	0	4	0	**4**	0	6	21	**27**	0	20	6	**26**
22	0	1	1	**2**	2	7	15	**24**	1	17	2	**20**
23	0	1	1	**2**	1	6	14	**21**	0	12	2	**14**
24	2	5	2	**9**	6	19	39	**64**	3	41	25	**69**
25	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**
Cat 5												
26	8	5	2	**15**	7	2	39	**58**	6	20	46	**72**
27	8	5	3	**16**	9	14	54	**77**	7	39	36	**82**
28	1	4	0	**5**	3	55	1	**59**	2	42	21	**65**
29	2	4	1	**7**	1	8	18	**27**	2	23	5	**30**
30	3	5	2	**10**	6	18	53	**77**	6	37	42	**85**
31	0	5	0	**5**	3	12	40	**55**	2	32	19	**53**
32	0	0	0	**0**	0	0	1	**1**	1	10	4	**15**
33	0	3	0	**3**	0	4	22	**26**	4	18	21	**43**
34	7	7	2	**16**	6	17	44	**67**	5	32	32	**69**
35	1	0	1	**2**	2	0	10	**12**	2	8	7	**17**
Cat 6												
36	0	0	0	**0**	2	4	6	**12**	0	15	0	**15**
37	2	2	0	**4**	1	12	32	**45**	0	46	6	**52**
38	6	5	4	**15**	5	15	52	**72**	7	21	51	**79**
Total	**181**	**105**	**53**	**339**	**181**	**353**	**955**	**1499**	**184**	**815**	**708**	**1707**
%	53%	31%	16%	100%	12%	24%	64%	100%	11%	48%	41%	100%

Table 6 Reported use of Chinese and international guidelines

Reported guidelines Research instrument Item 37	**2006**	**2008**	**2010**
Chinese guidelines (CN)			
SZSE	1	10	17
SSE	0	31	33
CASS	0	0	7
SASAC	0	2	9
CN Others	1	5	14
Subtotal CN	*2*	*41*	*51*
International guidelines (INT)			
G3	2	22	33
Global Compact	1	4	7
INT Others	0	1	8
Subtotal INT	*2*	*23*	*34*
Total	**4**	**45**	**52**

Table 7 Reporting frequency and change in potential additional climate-change reporting

[Key: ADF: Actual disclosure frequency; MDF: Maximum possible disclosure frequency]

Year	2006			2008			2010		
	ADF	MDF	% MDF	ADF	MDF	%MDF	ADF	MDF	%MDF
International guidelines only	84	1900	4%	457	1900	24%	542	1881	29%
Chinese guidelines	255	1900	13%	1042	1900	55%	1165	1881	62%
Total	339	3800	9%	1499	3800	39%	1707	3762	45%
Change % based on *potential additional* climate-change reporting				2006-2008			2008-2010		
INT				21%			6%		
CN				48%			15%		
c.f. commonly used measurement of change % based on absolute growth									
INT				444%			19%		
CN				309%			12%		

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