CDSB Climate Disclosure Standards Board

The case for consistency

in corporate climate change-related reporting

Foreword

The Climate Disclosure Standards Board (CDSB) is delighted to be working with the Global Reporting Initiative (GRI), the Organization for Economic Co-operation and Development (OECD) and the United Nations Conference on Trade and Development (UNCTAD) on an inter-agency project designed to support greater consistency of approach to the demand for and supply of corporate climate change-related information.

The attention that corporate sustainability reporting has attracted in preparation for the Rio+20 Conference[1] suggests that now is the right time to consider the relative merits of greater consistency of approach towards corporate sustainability reporting. As one of the most developed areas of non-financial corporate reporting, climate change-related reporting warrants particular attention. The CDSB Working Paper "The Case for Consistency in Corporate Climate Change-Related Reporting" is therefore being launched to coincide with the Rio+20 Conference and the release of the OECD Working Paper, "Stocktaking of Domestic Greenhouse Gas Emissions Schemes" (referred to here as "the OECD Working Paper"). The Working Papers support and advance the inter-agency project, build on 2012 workshops organized by the OECD[2] and UNCTAD[3], offer input into discussions on corporate sustainability reporting and prepare for future work on the inter-agency project.

Green growth, (broadly defined as growth that integrates economic performance and environmental sustainability[4]), requires the mobilization of financial, technological and human capital at local, national and international levels and at an unprecedented pace and scale. Commonly understood and consistent structures are required to support green growth, including measurement, reporting, accounting and assurance structures that communicate the information necessary for assessing progress towards green economic growth.[5] Now is the right time to develop such structures before too many different national regulatory approaches are developed or become entrenched.

Many recognize that green growth and the structures needed to support it require business input and public-private partnerships to deliver and accelerate green investment, innovation, products and services. Many organizations, including CDSB are already working to create these structures. CDSB is an international organization committed to multi-stakeholder partnerships in order to encourage the integration of climate change-related information into mainstream corporate reporting so as to inform mitigation, adaptation and investment decisions and actions. CDSB advances its mission by acting as a forum for collaboration on how existing reporting standards and practices can be supported and enhanced so as to link financial and climate change-related information, respond to regulatory developments and build trust in reporting.

CDSB welcomes feedback on this Working Paper. Comments and suggestions may be sent by e-mail to consistency@cdsb.net. This Working Paper is not a comprehensive analysis of all of the evidence and issues pertinent to considering the relative merits of greater consistency of approach to climate change-related reporting. CDSB intends to continue its work on consistency in climate change-related reporting after publication of this Working Paper and welcomes input from individuals and organizations interested in collaborating with CDSB to progress its work.

Any opinions expressed in the CDSB Working Paper are those of the authors and do not necessarily reflect those of CDSB or its members.

[1] Clause 24 of the Rio+20 "Zero Draft" for the Future we Want calls for "a global policy framework requiring all listed and large private companies to consider sustainability issues and to integrate sustainability information within the reporting cycle". http://www.uncsd2012.org/rio20/mgzerodraft.html#IId

[2] http://www.oecd.org/document/6/0,3746,en_2649_34893_49513158_1_1_1_1,00.html

[3] http://unctad.org/en/Pages/MeetingDetails.aspx?meetingid=49

[4] http://www.gggi.org/about/overview

[5] Report from the Global Green Growth Forum (3GF) meeting October 2011, Copenhagen, http://www.globalgreengrowthforum.com/wp-content/uploads/2012/05/3GF-Report-20111.pdf

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The case for consistency in corporate climate change-related reporting

"potentially, we are already with our feet in the water, reaching the level of our knees. Yet we make decisions and keep promising that our toes will remain dry..[6]"

Introduction

1) The multi-faceted, multi-disciplinary nature of climate change and its social, ecological, ethical and economic consequences demand complex policy decisions. Those decisions depend in turn on the supply of robust information. There is a growing trend for information to be sought from organizations[7] about the way in which they respond to the risks and opportunities presented by climate change. This trend reflects the prevailing view that those charged with management and governance of organizations are stewards not just of investors' money, but also of human, natural and social capital, with responsibility to disclose how that stewardship is being exercised through the organization's strategy and management of risks and opportunities.

Climate change-related reporting - a component of non-financial reporting

2) Requests for information about climate change and the disclosures that organizations make in response to those requests form part of wider reporting activities that may be described collectively as non-financial reporting relevant to the governance of organizations. There is wide recognition among governments, organizations and their stakeholders that "disclosure of non-financial information is a useful management tool, an important mechanism for the communication of risk management information to investors, a crucial source of information for affected communities and other stakeholders assessing the impacts of a company…[and that it provides benefits to the organization such as] benefits from cost savings, easier access to capital, improved performance on financial markets and increased stability…[8]".

3) Increased attention on corporate non-financial reporting reflects the growing realization that decisions about the performance of an organization depend on a wider range of information than is available from traditional financial reports. Non-financial reporting, including on climate change-related matters, is therefore composed of various elements including information about corporate strategies, governance, compensation arrangements, risk management, product development, market share, product quality, customer retention, staff satisfaction and environmental and social impacts of the organization's activities.

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[6] Attributed to Fatih Birol (cited in Kriener 2011, "The Setbacks of Durban" www.zeozwei.de) in "Some reflections on climate change, green growth illusions and development space" by Ulrich Hoffman, UNCTAD Discussion Paper No. 205, December 2011

[7] The term "organization" can incorporate a wide range of enterprises including public and private corporations, partnerships, joint ventures and other enterprises whether organized as a single entity or as a group of entities for which consolidated public disclosures, including financial statements are prepared. However, for the purposes of this Working Paper, the term "organization" or "company" refers to public companies or groups of companies that can offer their shares to the public and references to organization(s) or company(ies) in this Working Paper should be construed accordingly. The focus on public companies reflects the fact that currently those are the companies most likely to be asked for or to supply of climate change-information. However, many of the findings and observations in this Working Paper are equally applicable to other types of business organization.

[8] EU legislation on non-financial reporting by companies – Position Paper of the European Coalition for Corporate Justice

4) As well as covering a wider range of information than traditional financial reports, non-financial corporate reporting reflects the fact that decisions about the performance of organizations are made by a wider range of stakeholders than those to which financial reports are directed. According to the International Accounting Standards Board's Conceptual Framework for Financial Reporting, general-purpose financial reports are primarily designed to serve the needs of existing and potential investors for information about the resources of the reporting organization and how effectively those charged with its management and governance have discharged their responsibility to use those resources. Whilst often aimed at existing and potential investors, non-financial corporate reporting, including on climate change, is also designed to serve a much wider audience, including non-governmental organizations, regulators, employees, consumers and the media. Collectively, those interested in non-financial corporate reporting, including on climate change, are referred to in this Working Paper as "stakeholders".

Climate change-related reporting

5) The types of outcomes that are generally sought from non-financial disclosure include better-informed and more efficient markets and internalization of negative externalities. Those outcomes apply equally to climate change-related reporting, but in addition, climate change-related reporting schemes are designed to fill gaps and correct market and governance failures attributed to the absence of international regulation on climate change. In response to the demand for robust information to fill these gaps and support policy and other types of decisions on climate change by a wide range of stakeholders, reporting schemes applicable to organizations have developed at a regional, national and global level. The number of mandatory and non-mandatory climate change-related reporting schemes and requirements has increased considerably since 2003 as illustrated by the OECD Working Paper.

6) Climate change-related reporting schemes vary in terms of the objectives that they are designed to support, the types of reporting provisions they include and the actors responsible for their introduction or oversight. Provisions on climate change-related reporting have been introduced by securities, financial, environment, energy and governance regulators and policy makers, standard-setters, stock exchanges, non-governmental organizations, investor groups and so on. The range of organizations involved varies from country to country as does the type of provision introduced. Provisions can take the form of law aimed specifically at climate change mitigation or pollution control legislation, trading schemes, corporate governance codes, financial reporting and management commentary rules, company and environmental laws. Requests for information originate from various sources including:

   a) **Shareholders** and existing and potential investors anxious to know the extent to which the investee organization is resilient against impacts from climate change;
   b) **Environment regulators** requiring details of greenhouse gas emissions in order to determine the extent to which business is contributing to GHG emissions reduction targets, to identify regulatory interventions with the greatest impact or to aggregate and disseminate information for the public record;
   c) **Securities or business regulators** requiring organizations to declare any information about risks, including climate change-related risks, that might affect the economic decision-making of existing and prospective investors;
   d) **Non-governmental organizations** acting on behalf of the public interest so as to hold companies accountable for the consequences of their actions.

7) Although they originate from different sources, climate change-related reporting schemes often have similar features and cover similar types of content. Content requirements have been established by regulators and by leading climate change disclosure initiatives including the Carbon Disclosure Project (CDP), the Global Reporting Initiative (GRI), The Climate Registry (TCR), World Resources Institute (WRI), World Business Council for Sustainable Development (WBCSD) and Investor Network on Climate Risk (INCR) coordinated by CERES. The type of information that should be considered by organizations when preparing climate change-related disclosures generally falls into four categories:

   a) **Strategy and governance**
      Information about the way in which the reporting organization's business strategy is affected by climate change and the strategies employed by the reporting company to respond to climate change, including the resources and governance processes the company allocates to climate change.
   b) **Risks and opportunities**
      The assessment of risk and opportunities related to climate change and the significant actions the reporting company is taking to manage those risks and opportunities.
   c) **Greenhouse Gas (GHG) emissions**
      The measurement of greenhouse gas emissions from the reporting organization's direct and indirect activities, referred to in this Working Paper as "GHG emissions results", but also known as the organization's "carbon footprint" or "carbon inventory".
   d) **Performance**
      A description of any plans the reporting company has in place to reduce or manage GHG emissions or energy consumption, together with disclosures about progress against any targets.

8) The OECD Working Paper (pages 35 - 36) illustrates that, although there are similarities in the type of content that organizations are asked to report, there are some significant variations in the "building blocks" that make up different corporate climate change reporting schemes. Those building blocks specify the scope and boundaries of organizations to which reporting schemes apply, the calculation methods that should be used to prepare GHG emissions results, the process for verifying or assuring information and the platform on which information should be reported. Variations in those building blocks lead to variation in what to report, how much to report, who reports and how to approach measurements.

Defining "consistency"

9) Therefore, even where similar information is requested, different reporting practices can develop because different actors ask for information in order to satisfy different objectives and specify different, or no, building blocks for the preparation of information and different or no rules for compliance with reporting requirements. This, in turn, results in actual or perceived lack of consistency towards climate change-related reporting. Generally, lack of consistency can be attributable to:

   a) **Differences between the requirements** of corporate climate change-related reporting schemes. For example, mandatory schemes are generally likely to specify more prescriptive compliance requirements and their scope may be restricted to a particular jurisdiction or type of activity or facility. Although some voluntary schemes, including The Climate Registry, also provide specific compliance requirements, they generally allow more flexibility or choice about how an organization reports climate change-related information in the interests of building capacity; and
   b) **Differences in approach** to and interpretation and application of those requirements by organizations, resulting in different reporting practices.

This Working Paper report therefore distinguishes, but addresses both of the following types of consistency:

i) **Consistency between reporting schemes**, referring the alignment or not between the reporting requirements specified by schemes; and

ii) **Consistency of approach** to climate change-related reporting by organizations, meaning the way in which organizations interpret and apply the requirements of the climate change-related schemes in which they are required or choose to participate.

10) Arguably the number and variety of schemes designed for disclosure of climate change-related information, the variation between them and the different reporting practices that have developed:
    a) Are at variance with the global nature of and risks related to climate change;
    b) Produces variation in the quality, quantity and relevance of disclosures;
    c) Prevents the effective use of information by markets and stakeholders; and
    d) Discourages disclosure because preparers are uncertain about what they should report and how to comply with user needs.

11) Greater consistency between reporting schemes and greater consistency of approach towards climate change-related reporting is expected to address the points listed above and to bring benefits, such as more comparable information, that are discussed in more detail below. However, there is currently limited evidence about how the lack of consistency between reporting schemes and reporting practices manifests itself and the way in which it affects preparers and users of information. Neither is there detailed evidence about the expected effects that greater consistency of approach is likely to have or how it could be achieved. The focus on corporate sustainability reporting in preparation for the Rio+20 Conference[9] suggests that now is the right time to consider the relative merits of greater consistency of approach. Furthermore, it seems expedient to consider consistency at a time when regulatory and corporate approaches to non-financial reporting are still under development, investors have not fully integrated non-financial reporting into their risk assessment modeling and behavioral and regulatory paths are not yet entrenched.

12) This Working Paper builds on the OECD findings by considering the case for consistency in corporate climate change-related reporting. The Working Paper will examine:

Part I – How lack of consistency may manifest itself;

Part II – Some of the evidence to date of demand for greater consistency between reporting schemes and for greater consistency of approach to climate change-related reporting practices;

Part III – The challenges likely to be encountered in moving towards greater consistency of approach to both reporting requirements and disclosure practices.

13) Variations in the "building blocks" that make up corporate climate change reporting schemes (OECD Working Paper pages 35-36) which produce variation in what to report, how much to report, who reports and how to approach measurements, apply equally to other areas of sustainability reporting[10]. 'Sustainability reporting' is a broad term and is considered by many to be synonymous with Corporate Social Responsibility (CSR) reporting, Environmental, Social and Governance (ESG) reporting and non-

[9] Clause 24 of the Rio+20 "Zero Draft" for the Future we Want calls for "a global policy framework requiring all listed and large private companies to consider sustainability issues and to integrate sustainability information within the reporting cycle". http://www.uncsd2012.org/rio20/mgzerodraft.html#IId

[10] GS Sustain: Challenges in ESG Disclosure and Consistency, October 2009 and KPMG 2011 Survey of Corporate Social Responsibility Reporting (page 20)

financial reporting as a 'counterpart' of financial reporting[11]. Climate change-related information is often embedded within and represents one of the most widely reported themes in sustainability reports[12]. Furthermore, there is an overlap between the building blocks of climate change reporting schemes and sustainability reporting schemes. This makes it difficult to separate any discussion about the relative merits of greater consistency in climate change-related reporting from similar discussions about consistency in other forms of sustainability reporting. Therefore, in examining the demand for and expected benefits of greater consistency of approach to climate change-related reporting, this Working Paper will also draw on research about the benefits of greater consistency in sustainability reporting more generally.

14) Currently, although there is some research[13] into the number and type of reporting schemes in existence, inconsistencies between climate change-related reporting requirements and practices are poorly understood. In some cases, the perception of lack of consistency is attributable to the absence of clear distinctions between the objectives of different reporting schemes and the respective audiences for information. Greater clarity on why particular information sets are required, and for whom, might bring some order to the current climate change-related reporting landscape and thereby minimize perceptions of lack of consistency. This Working Paper considers the case for and challenges associated with achieving consistency between reporting schemes and consistency of approach to climate change-related reporting in order to help identify where it might be possible to adopt a degree of uniformity and/or to understand why multiple reporting requirements on climate change are required in some instances. Whatever the relative merits of and challenges to greater consistency to corporate climate change-related reporting, this Working Paper acknowledges that some variation or flexibility in reporting requirements and disclosure practices will remain even if the case for consistency is made and the challenges can be resolved because differences in policy objectives, culture and experience are likely to remain.

[11] Wensen, Katelijne van; Wijnand Broer; Johanna Klein and Jutta Knopf 2011: The state of play in sustainability reporting in the EU.

[12] The State of Play in Sustainability Reporting in the European Union – a Project Report for the European Commission led by adelphi with support from CREM, PPRC, SOMO and ICLEI.

[13] "Carrots and Sticks – Promoting Transparency and Sustainability" 2010, KPMG, Unit for Corporate Governance in Africa, GRI and UNEP. Also "GHG Schemes Addressing Climate Change – How ISO Standards Help, 2010, ISO

I. How lack of consistency manifests itself

"The business community needs clear global rules, powerful regulatory incentives and a level-playing field to support it in moving to sustainable growth…[14]".

15) Negotiating a multiplicity of reporting demands and requirements can be complex for companies when preparing climate change-related information. While there is a degree of consistency about the subject matter that should be covered in climate change-related disclosures, for example, that they should include GHG emissions from the organization's activities, variations remain in the exact content that should be supplied and the way in which that content should be prepared and presented. This section examines how those variations manifest themselves in relation to:
    i) Greenhouse gas emissions reporting; and
    ii) Disclosure of climate change-related risk; and
    iii) Where information is reported.

I (i) GHG emissions reporting

16) Depending on the jurisdictions within which it operates and the schemes in which it chooses or is obliged to participate, a single organization might be asked to report greenhouse gas emissions from its activities for one or more of the following purposes:
    a) To inform investors of the degree of risk to which the organization is exposed from climate change impacts or from regulation designed to address climate change;
    b) To fulfil obligations under a carbon trading scheme;
    c) For compliance with regulatory and/or voluntary requirements to report greenhouse gas emissions;
    d) To participate in specialist indices such as the Dow Jones Sustainability Index.

17) The way and extent to which an organization responds to these requests depends on whether the reporting scheme includes rules or guidance explaining how the requirement to report GHG emissions is to be complied with or satisfied (such guidance is described as a "methodology" in this Working Paper, meaning the practices or steps defined by a scheme for preparing a GHG emissions inventory). Mandatory GHG emissions reporting schemes specify the monitoring, reporting, delivery, presentation and other compliance requirements that should be applied. However, when it comes to preparing a voluntary corporate inventory, there is more leeway of approach and the organization often needs to consider how to amalgamate information prepared for different purposes into a single consolidated account of its GHG emissions.

18) CDP responses illustrate the wide range of approaches that are applied to the preparation of a corporate GHG emissions inventory and the number of schemes or methodologies that are used, although it should be noted that not all organizations report to CDP and the number and type of schemes and methodologies identified through analysis of CDP responses does not represent a comprehensive list. In 2011, 402 of the Global 500 companies provided responses to CDP's information request. Companies were asked to select from among 14 GHG emissions monitoring and reporting methodologies which ones (one or more) they used to prepare their results.

[14] Expect the Unexpected: Building Business Value in a Changing World, KPMG, 2012

According to their responses, 263 (35%) used the GHG Protocol[15] and 166 (22%) said that they used "other" monitoring and reporting methodologies. The "other" methodologies named by reporting organizations, which are not ranked in terms of frequency of use or application, are listed below. The names or descriptions of each reporting methodology are listed as they appear in CDP's records with the complete name of the methodology added in square brackets where appropriate. Although companies responding to CDP have identified the following schemes as informing the basis on which they prepare GHG emissions inventories, not all of them represent or contain methodologies for preparing GHG emissions results. For example Japan's Act on the Promotion of Global Warming Countermeasures and Law on the Rational Use of Energy require monitoring and calculation of energy consumption and greenhouse gas emissions, but they are not measurement and monitoring guidelines or standards.

a) Certified Emissions Measurement and Reduction Scheme (CEMARS) New Zealand
b) US EPA Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98)
c) API Compendium of GHG emissions estimation methodologies for the oil and gas industry
d) World Steel Association Data Collection Tool
e) Western Climate Initiative [Requirements for Mandatory Reporting]
f) Mining Association of Canada GHG emission factors
g) Canadian Association of Petroleum Producers – "Calculating GHG emissions"
h) Ademe's Bilan Carbone
i) WBCSD Cement Industry Accounting and Reporting Standard Version 2
j) Japan Ministry of Environment Manuals [Manual for calculating and reporting greenhouse gas emissions – Japanese Ministry of Environment]
k) JVETS monitoring and reporting [Japan's Voluntary Emissions Trading Scheme (JVETS), Monitoring and Reporting Guideline, Japanese Ministry of Environment
l) Japan Act on Promotion of Global Warming Countermeasures
m) Japan Law on Rational Use of Energy
n) Carbon Trust Carbon Footprint Calculator
o) GRI Framework
p) IPCC methodologies [IPCC Guidelines for National Greenhouse Gas Inventories]

19) A total of 155 companies said that they used more than one reporting methodology or scheme to prepare their corporate GHG emissions inventory. On average each of those companies used three methodologies or schemes. However, individual reports show that companies using more than one methodology/scheme to prepare their GHG emissions results used between 2 and 8. It should also be noted that many voluntary and mandatory reporting schemes that specify GHG emissions measurement, accounting and reporting methodologies are based on, or are compatible with, the GHG Protocol and to the extent that this is the case, there is therefore some overlap or consistency between those schemes. Table 1 below is based on CDP 2011 G500 responses from three particular organizations. It illustrates the application of multiple schemes/methodologies by three organizations in three different sectors.

[15] The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Available at www.ghgprotocol.org and referred to in this Working Paper as the "GHG Protocol"

Table 1 – Examples of organizations applying multiple rules and frameworks for the preparation of consolidated GHG emissions results

Sector	Main geographies	Organizational boundary approach	Voluntary schemes	Mandatory schemes	Industry schemes
Metals & mining	South Africa, Australia, Europe, UK	Financial control	GHG Protocol	US EPA Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98) Canada GHG Reduction Plan EU Emissions Trading Scheme Australia NGER	
Real estate investment	Australia	Operational control	GHG Protocol ISO 14064-1 Defra Voluntary Guidelines New Zealand Guidelines for voluntary GHG reporting	Australia NGER USA Energy Information Administration 1605B	
Oil, Gas and Consumable Fuel	Italy, Europe	Operational control	GHG Protocol EPA Climate Leaders	IPCC Guidelines EU Emissions Trading Scheme US EPA Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98)	API Compendium of GHG emissions methodologies for the oil and gas industry

20) In order to ascertain whether the existence of mandatory rules on GHG emissions reporting influences the degree to which multiple methodologies or schemes are used for preparing GHG emissions inventories, the CDP 2011 G500 information relating to companies headquartered in Australia and likely to be subject to the National Greenhouse and Energy Act (NGER), was examined. All of the 13 G500 companies headquartered in Australia said that they were applying the NGER rules. However 11 of those companies said that they were also using other methodologies or schemes to prepare their corporate inventories. The statistics show that each company was using a total of four methodologies or schemes on average.

21) The CDP information request does not ask companies to explain why, for what purpose and to what extent they have used different methodologies or schemes for preparing GHG emissions results. Therefore, except where the purpose is to comply with mandatory reporting schemes, or where geographical restrictions apply it is not possible to draw conclusions about why multiple approaches are used for preparing a single data set on GHG emissions. The possibilities include:

a) Mandatory GHG emissions reporting schemes are restricted in their scope to facilities, units or organizations within their operational and geographical scope. Therefore voluntary reporting

schemes, which are mostly global in their application, are used to prepare residual GHG emissions results not covered by mandatory schemes, and/or to aggregate GHG emissions results for the whole of the reporting organization by reference to a single approach. There is no evidence in CDP responses as to how such aggregation is achieved in practice.

b) Some organizations seem to find that there is no single reporting scheme that includes all of the provisions they need in order to prepare GHG emissions results for the whole of the organization. Therefore, particular requirements, such as emission factors for certain gases or methodologies for particular activities or industry practices are sourced from specific, specialist sources or are developed by individual organizations or trade associations. CDP G500 responses for 2011 show some evidence of organizations developing their own approaches to calculating GHG emissions results, for example, in relation to fugitive emissions and gas exports.

22) In conclusion, it is evident that some organizations, particularly those operating in multiple jurisdictions and/or in industries where the calculation of GHG emissions involves complex or specialist approaches, are using multiple schemes and methodologies to prepare their organizational GHG emissions results. Furthermore, variations in the building blocks that make up each climate change-related reporting scheme mean that the type and degree of information might be the same under each requirement or might overlap or differ depending on the objective of the party setting the requirement to deliver information and whether an associated methodology for compliance is prescribed.

I (ii) Disclosure of climate change-related risk

23) Similar issues arise in relation to disclosures about how an organization manages risks associated with climate change. As with GHG emissions reporting, requests for information about climate change-related risks might originate from various sources including sustainability frameworks such as the GRI and investor-focused initiatives such as the CDP. Requirements to disclose climate change-related risks, often under the general description of environmental risks, also apply around the world for securities/listing compliance purposes and for corporate governance disclosure. Examples are shown in Table 2 below:

Table 2 – Examples of requirements to disclose environmental risks

Country	Provision	Commentary
Australia	The Australian Stock Exchange (ASX)'s Corporate Governance Principles and Recommendations, Principle 7	Information that might materially affect the price or value of a registrant's securities must be disclosed. Principle 7 clarifies that such risks include environmental and sustainability risks.
Canada	National Instrument 51-102 Continuous Disclosure	Canadian Securities Administrators Staff Notice 51-33 states that compliance with National Instrument 51-102 Continuous Disclosure Obligations requires information on environmental risks.
France	Grenelle II (Law No. 2010-788)	The law requires certain companies to include in their annual reports a section on social and environmental consequences of their activities and to provide a greenhouse gas balance sheet before 31 December 2012.
UK	The Companies Act 2006, section 417	The Act requires listed companies to report in their Business Review information on environmental matters and their impacts. Large quoted companies also have to report on environmental risks, policies and Key Performance Indicators.
Denmark	Management's review required by section 99a of the Danish Financial Statements Act	The Act requires companies to report on environmental capital.
USA	Securities Act 1933, Regulation S-K Items 101 and 103	In 2010, the SEC issued guidance to public companies clarifying that material climate change-related information must be included in corporate disclosures under existing law.

24) The provisions listed in Table 2 share the purpose of eliciting from organizations disclosures about risks that could materially affect the value of their securities. The provisions or associated guidance also agree that risks for this purpose could or should be interpreted to include environmental risks. Some regulators, for example, the USA SEC have made specific pronouncements that risks include those relating to climate change. Despite these shared requirements, there is an absence of national or global compliance approaches, for example, supporting guidance, regulation, frameworks, etc. that explain how organizations should comply with the requirements. NGOs and regulators that have reviewed compliance with regulations in certain jurisdictions have found significant variation of approach. For example, CERES reviewed SEC filings for the 2009 financial year and found "an array of climate change reporting examples…[and] too many companies fail[ing] to address the issue at all." [16] CERES' review of SEC filings also found differences between the quantity and quality of information about climate change-related risks reporting in 10-K and voluntary filings respectively, with investors having to turn to voluntary disclosures in some instances for more complete and comprehensive information about exposure to risk. CERES and Sustainalytics reviewed[17] the disclosures of 600 companies for the calendar years 2010 or 2011 and found that, despite the pronouncements of the SEC (see Table 2 above), only 39% (232) were "at least minimally addressing ESG risks within their financial filings, though for most this translates to briefly addressing the risks that emissions regulation or more comprehensive climate legislation could present…".

[16] CERES (2011), "Disclosing Climate Risks and Opportunities in SEC Filings"
[17] CERES and Sustainalytics - The Road to 2020: Corporate Progress on the CERES Roadmap for Sustainability

25) The Australian Council of Super Investors (ASIC) reviewed the sustainability reporting practices of the ASX 200 as at March 2010 and found that over half of the companies within scope of the principles and recommendations specified by the ASX (see Table 2 above) were reporting to a "basic" or "no reporting" level. Only 150 of the companies in the ASX 200 reported any sustainability information in their annual report which, as noted by ASIC, falls under the regulatory regime of the Corporations Act that is, in turn, supported by rules prescribed by the ASX, including those in Table 2 above. The ASIC concluded that despite their efforts to "emphasize the importance of disclosure to companies,..the majority of companies continue to see sustainability reporting as 'nice to have' and..reporting on sustainability risks is not seen as being of material significance to investors." In response, in June 2011, the ASIC and the Financial Services Council produced an "ESG Reporting Guide for Australian Companies" to clarify the reporting expectations of investors and (amongst other things) to help companies meet their obligations under Principle 7 of the ASX Corporate Governance Principles and Recommendations.

26) The findings by CERES in the USA and the ASIC in Australia indicate that the introduction of requirements to make disclosures on environmental risk is not, in itself, sufficient to elicit compliance. Subsequent action taken by the ASIC and Financial Services Council in Australia signifies that standards or guidance for compliance with such requirements are often a necessary supplement.

I (iii) Placement of information

27) As well as differences in the way in which GHG emissions and climate change-related risks are reported, lack of consistency in reporting requirements and practices manifests itself in the various documents and places in which organizations report information. In many jurisdictions there is a periodic, often annual, mandatory requirement for listed, large and/or public companies to provide their shareholders with information about the organization's activities, performance and financial condition. In some jurisdictions such a report is known as the "annual report" and, because it often contains information required by law, such as financial and governance statements, it is regarded as a mainstream, mandatory or quasi-mandatory document. In addition to the annual report, many organizations publish voluntary material such as sustainability and corporate social responsibility reports. Information about climate change may appear in one or more of these sources of material and/or on company websites.

28) Of the 402 Global 500 companies that provided responses to CDP's 2011 information request, 199 said that they report climate change-related information in both annual and voluntary reports. An analysis of geographical trends shows that the practice of publishing both annual and voluntary reports is most widespread amongst companies whose primary listing is in the US, UK and France, as illustrated by Table 3 below.

Table 3 – Trends in the placement of climate change-related information

Exchange	Total number of responding companies	Number of companies producing both annual and voluntary reports	Percentage of companies in sample producing both annual and voluntary reports
S&P 500	137	63	45%
FTSE 600	25	21	84%
France 200	25	18	72%
Germany 200	18	16	88%

29) The 199 companies that produced both annual and voluntary reports issued 551 voluntary reports between them that included climate change-related information. This suggests that, on average, each company produces nearly three voluntary reports and an annual report containing climate change-related information. The CDP information request does not ask companies to explain why they report on climate change in multiple documents and places. However, one possibility is that companies choose to report to different audiences via different reporting channels because each report is designed to achieve different objectives and is subject to different internal and external review processes.

Part I Conclusions

30) In summary, except where requirements are prescribed in law, companies can report on climate change through self-selection, on a flexible basis, in different places and according to different measurement/reporting standards or none. This can create the impression of inconsistency and confusion for stakeholders, particularly where similar types of information are being provided through different channels as a result of different requirements. Although different stakeholders require information about climate change from organizations and their requirements reflect different motivations, what lies at the heart of all of their requests is a desire to understand how the organization's activities, business model and strategies affect (positively or negatively) or are impacted by (positively or negatively) climate change such that investors, consumers, the environment, the planet and the next generation may also be positively or negatively affected. This underlying shared sense of purpose as well as the similarities already shared by some reporting schemes could serve as the basis for greater consistency of approach. This is examined in greater detail below.

II The case for and expected benefits of greater consistency

"No truly assertive climate pioneer alliances exist to accelerate the establishment of post-fossil transnational structures[18]…"

31) At this stage in its development, the variation in climate change-related reporting reflects the fact that demand for information comes from multiple sources and for multiple purposes and that there is no global standard for the preparation or presentation and disclosure of climate change-related information. Furthermore, as well as responding to particular requests for information for specific purposes, organizations often attempt in their disclosures to answer more general questions about the apparent lack of trust between companies and society by providing evidence of social and environmental accountability[19]. Therefore, as well as negotiating variability between specific requests for similar types of information, companies must decide how to incorporate that information into a wider "discourse of care" that seeks to tread a middle ground between economic values and environmentalism[20]. Business itself can be affected by what is sometimes perceived as mere "green washing" or public relations and media exercises. As a result, front-runners from the business community are increasingly calling on policy-makers to establish clear "rules of the game". In the Copenhagen Communiqué, over 500 business organizations from the US, EU, Japan, Australia, Canada, Brazil, Russia, China, India and South Africa signaled their support for "credible measurement, reporting and verification of GHG emissions".

32) Various investor groups have also called for greater consistency of approach to climate change-related disclosure. Although they demonstrate strong interest in climate change-related information, such as through their support for CDP and initiatives such as the UN Principles for Responsible Investment, investors[21] and others have difficulty in interpreting and comparing information prepared according to a variety of approaches and in response to demands from different sources and for different reasons. A 2009 analysis by GS Sustain of the ESG disclosures of 566 companies across nine global industries found that "where [environmental] data is reported, analysis is challenged by differences in reporting standards and guidelines across regions and companies…." Therefore, the market place "*sees an imperfect and incomplete picture both in what is said and in the rules dictating what should be said*[22]."

33) In response, investor groups have formed coalitions to prompt action on more effective and consistent sustainability reporting. For example, an investor coalition between the Investor Group on Climate Change (IGCC), the Institutional Investor Group on Climate Change (IICGG) and the Investor Network on Climate Risk (INCR) published their "Expectations of Corporate Climate Risk Management[23]" in January 2012. Those expectations include:

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[18] World in Transition – A Social Contract for Sustainability (Summary for Policy Makers). German Advisory Council on Global Change, Berlin, available at www.wbgu.de

[19] Vol 24, No 8, 2011, entitled "Private climate change reporting: an emerging discourse and opportunity" (pp. 1119 – 1148)

[20] Vol 24, No 8, 2011, entitled "Private climate change reporting: an emerging discourse and opportunity" (pp. 1119 – 1148)

[21] "Financial Institutions : Taking Greenhouse Gases into Account" A report produced by CDSB for DEFRA, Matthew Haigh and Matthew A. Shapiro, January 2011

[22] Smith, J.A., Morreale, M. & Mariani, M.E, Climate change disclosure: Moving towards a brave new world, Capital Markets Law Journal, August 2008, p. 2

[23] http://www.iigcc.org/__data/assets/pdf_file/0013/15331/Institutional-investors-expectations-of-corporate-climate-risk-management.pdf

i) Reporting by organizations of GHG emissions using "established standards" such as the GHG Protocol and ISO 14064; and
ii) Disclosures about GHG emissions and climate change-related risks through annual reports, compliance filings and to CDP using sector specific disclosure models developed by the investor coalition and the GRI.

34) Specific evidence about the attitudes of organizations to actual or apparent lack of consistency in climate change-related reporting is limited. However, there is more extensive evidence of corporate and investor attitudes to non-financial disclosure more generally and the results are arguably also applicable to climate change-related reporting. For example, mixed responses were received to the European Commission's public consultation on disclosure of non-financial information published in April 2011[24]. The majority of companies considered the existing non-financial reporting regime to be sufficient because it allows companies a degree of flexibility in their disclosures and therefore enables them to focus on matters of most relevance and materiality to their business operations. Others argued that where reporting was not properly addressed or legislation was vague or confusing, this could lead to less relevant and comparable information being reported.

35) An Association of Chartered Certified Accountants' (ACCA) report on "Re-assessing the value of corporate reporting" examined the value of the Annual Report to various stakeholders. As noted in Table 3 above, climate change-related information is often included in the Annual Report. Forty-one per cent of those surveyed for the ACCA's report agreed that information provided in Annual Reports is easy to use for the purposes of assessing corporate performance. Twenty-six per cent said that it was difficult to use Annual Reports and, of those, thirty-five per cent attributed this difficulty to the variety of standards and legal requirements in place for corporate reporting.

36) Commentaries and reports that specifically consider climate change-related disclosure and those that examine non-financial disclosure more generally suggest that whilst some consistency of approach to reporting is necessary for benchmarking and comprehension of disclosures, this must be balanced with flexibility so that organizations can report on those matters that are of most relevance and materiality to their business operations. Furthermore, stakeholders are anxious not to add the burden of separate and additional reports[25]. This is consistent with responses to the UK Department of Business Innovation and Skills' consultation on the future of narrative reporting[26] which noted that "setting more detailed or standardized requirements [on narrative reporting] might aid comparability but would risk a more compliant boilerplate approach rather than greater engagement". With regard to the number and variety of requirements, respondents "noted [that] the different sources and volume of sometimes overlapping or conflicting regulatory requirements and guidance….was…a particular challenge for companies and an area offering scope for simplification, for example, by drawing them together and eliminating duplication. The piecemeal or incremental approach which added requirements without reviewing whether existing requirements were needed was a problem…."

37) In summary, evidence suggests that more order could be brought to bear on the multiplicity of reporting arrangements in place, which, in turn, could lead to greater consistency of approach, by:

[24] European Commission Internal Market and Services DG – Summary report of the responses received on the public consultation on disclosure of non-financial information by companies, April 2011
[25] European Commission Internal Market and Services DG – Summary report of the responses received on the public consultation on disclosure of non-financial information by companies, April 2011 (page 7)
[26] BIS, Department for Business Innovation and Skills – Summary of responses – The Future of Narrative Reporting – A Consultation; December 2010

a) Making rules sufficiently stringent to avoid excessive promotional material in corporate reports and associated perceptions of green-washing, but balancing this with sufficient flexibility to allow organizations to report on matters of most importance to their business performance;
b) Coalescence around standards, protocols and approaches that are already widely adopted for the purposes of preparing corporate reports;
c) Eliminating duplicate requirements and avoiding adding new requirements where it is possible to consolidate existing requirements and practices.

38) Some organizations are already responding to and/or developing new initiatives to address these themes. For example:

a) **Sector specific initiatives** - A joint Industry Task Force on Greenhouse Gas (GHG) Reporting was convened under the auspices of the IPIECA Climate Change Working Group in collaboration with the American Petroleum Institute (API) to produce the Petroleum Industry Guidelines for Greenhouse Gas Reporting (May 2011). The development of the guidelines was prompted partly "in recognition of the large number of existing GHG accounting and reporting approaches." The stated purpose of the guidelines is to "promote consistency in the voluntary accounting and reporting of petroleum industry GHG emissions." Similar sector specific guidelines on greenhouse gas reporting have been developed for the cement industry by the World Business Council for Sustainable Development and for the electric utilities by the Institutional Investor Group on Climate Change and The Climate Registry[27]. Both of these sector specific initiatives were based on The GHG Protocol so as to consolidate and complement existing practice to take account of industry specific features rather than adding to existing requirements.

b) **Harmonization activities within regions** – The European Commission and government departments in Australia and Canada are respectively putting in place administrative measures to harmonize administrative practices for climate change-related reporting. The European Commission's harmonization activities are described on their Climate Action webpage[28]. Australia's National Greenhouse and Energy Reporting Scheme was "designed to reduce the duplication of reporting requirements across related programs and create a single national reporting framework." However, multiple reporting obligations remain according to the Australian National Audit Office[29]. A survey of corporations cited up to ten reporting obligations for different state, territory and/or Australian Government programs as well as voluntary international commitments such as the GRI. Of 108 respondents to the survey, 63 stated that there had been no reduction in reporting requirements as a result of the National Greenhouse and Energy Reporting Scheme. Therefore, although the National Greenhouse and Energy Reporting Scheme was designed to reduce reporting requirements, surveys show that multiple obligations remain and the National Audit Office has therefore recommended that the Australian Government should give priority to streamlining current reporting requirements. In December 2010, Canada introduced a "one-window" GHG reporting system designed to allow organizations to submit GHG emissions information once only to a common web interface that acts as a hub thereby meeting the requirements of both state and federal reporting schemes.

c) **Advocacy** - The Aviva-led Corporate Sustainability Reporting Coalition is calling on all United Nations member states to commit to developing a Convention on Corporate Sustainability Reporting at the UN Conference on Sustainable Development in June 2012.The call to action was prompted in part by the report "Sustainable Stock Exchanges: A Report On Progress", which indicated that Stock

[27] The Climate Registry's Electric Power Sector Protocol
[28] http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm
[29] www.anao.gov.au/Publications/Audit-Reports/2011-2012/

Exchanges would welcome a global approach to consistent sustainability reporting.

d) **Exceptions designed to avoid duplication –** The UK CRC Energy Efficiency Scheme limits or negates any overlap in the reporting of GHG emissions that are already covered by the EU Emissions Trading Scheme. The Climate Registry's corporate voluntary reporting program accepts all data reporting in accordance with mandatory requirements in order to minimize duplication.

39) The case for greater consistency of approach to climate change-related reporting is, to some extent, made by these and the other activities that are already underway to progress or advocate for greater consistency. Greater consistency of climate change-related information requests and disclosure practices is expected to bring the following benefits:

a) Reduction of complexity and reporting burdens for preparers of information and enhanced usefulness and comparability of information for users;
b) Alignment of internal and external reporting and of the interests of information preparers and users;
c) The clarity and rigor that is necessary for compliance, assurance and enforcement; and
d) Help create the common language for reporting that is necessary for linking and harmonizing schemes, including trading schemes. It is beyond the scope of this Working Paper to examine the linking of market-based mechanisms for mitigating climate change, such as carbon taxes and emissions trading schemes. However, various studies and reports[30] that comment on the advantages that linking is expected to offer, compared with a more fragmented approach, also identify the need for common monitoring, reporting, compliance, verification and enforcement standards, which in turn require greater consistency of approach towards climate change–related reporting.

Part II Conclusions

40) Whilst there is strong evidence of the demand for and benefits of greater consistency of approach to climate change-related reporting requirements and practices, there is also evidence that this must be balanced with the need for flexibility so as to discourage "boiler-plate" type disclosures. In the absence of a single organization with responsibility for climate change-related disclosure, industry groups and non-profit organizations, such as those referenced above are forming coalitions to find and promote this balance through their member constituencies and develop new approaches that are gradually being adopted as good practice. Whilst there is some support for the use of globally recognized standards to encourage greater consistency of approach (e.g.: paragraph 39 a) above), the majority of evidence and commentary on the development of a global standard for climate change-related disclosure suggests opposition to an entirely new standard. For example, the EU consultation on non-financial reporting concluded that the EU should draw on frameworks already developed at international level rather than create new standards and principles. UNCTAD's 2010 World Investment Report agrees that a global standard should draw on and policy makers should encourage adoption of existing, tried and tested, market-accepted provisions and practices. Given the disparity of existing provisions that are relevant to climate change-related disclosure, development of a global standard is likely to involve an integration or convergence exercise at institutional and jurisdictional level through securities, financial and stock exchange regulators, ratings agencies, environmental regulators and so on. The next part of this Working Paper examines some of the challenges that might be encountered during such a process.

[30] Dellink, R, B, et al (2010), "Towards Global Carbon Pricing: Direct and Indirect Linking of Carbon Markets", OECD Environmental Working Paper No. 20, 2010, OECD publishing. State and Trends of the Carbon Market, 2011, World Bank

III Challenges en route to consistency

"…today's corporation can evolve into Corporation 2020 [one that can be profitable whilst contributing to the green economy]…but… vital planks of change must be put in place with urgency… The first is disclosure of externalities. This will provide the missing information needed by corporate managers, governments, civil society, consumers and investors to differentiate their responses to different corporations. There are many financial reporting agencies around the globe….. the rules of which require that corporations submit annual financial reports. These bodies should commission research and develop methodologies for measuring the most material corporate environmental externalities, as well as those from human and social capital. These externalities should also be disclosed in statutory annual reports…[31]*.".*

41) Certain challenges are likely to be encountered en route towards achieving greater consistency of approach to both reporting requirements and disclosure practices. These include:
   a) **Political and policy-related challenges** in negotiating alignment of reporting requirements in terms of the scope and applicability of requirements and what and how organizations should report in order to comply with them;
   b) **Technical challenges** including issues related to organizational boundary setting, defining materiality, GHG measurement and reporting and accounting for carbon instruments;
   c) **Practical challenges** regarding availability of information, capacity building, design of company systems and availability of corporate resources for reporting activities;
   d) **Communication challenges** about the way in which organizations should express performance, for example, using key performance indicators, and the use of technology to enable more effective communication and transfer of information between schemes;
   e) **Challenges in establishing mechanisms for review** of climate change-related disclosures to ensure that they are reliable and robust and meet the needs of stakeholders.

42) A full analysis of the challenges likely to be encountered en route towards greater consistency of approach to climate change-related reporting requirements and practices is beyond the scope of this working paper. However, some aspects of the challenges referenced in paragraph 41 b) and c) are explored below in order to illustrate the type of issues that would need to be addressed en route to greater consistency of approach.

Technical challenge – organizational boundary setting and providing information for multiple audiences

43) Depending on the objective of the reporting scheme, different requirements and interpretations exist on whether and to what extent climate change-related reporting should include information about the activities of a parent company, its subsidiaries, joint ventures, associates, suppliers and upstream and downstream activities. Various factors affect the way in which organizational boundaries are determined for reporting purposes, including the prescriptions of legislation, the approaches recommended by voluntary protocols, the objectives of reporting, where information is to be reported, the structure of the corporate group and the availability of data. ERM's report for the European Commission[32] notes that

[31] Sustainability: The Corporate Climate Overhaul, Pavan Sukhdev, Published in Nature 486 27-28 7 June 2012
[32] Company GHG Emissions Reporting – a Study on Methods and Initiatives (ENV.G.2/ET/2009/0073), Revised Final Report, October 2010. A report for the European Commission by ERM

"..current guidance on setting of reporting boundaries….. is typically open to a wide degree of interpretation by the user..". This in turn diminishes the consistency and comparability of information reported to stakeholders.

44) The GHG Protocol Corporate Standard currently allows for three approaches to organizational boundary setting:
   a) Entities over which the reporting organization has financial control;
   b) Entities over which the reporting organization has operational control;
   c) Entities in which the reporting organization has an equity share.

45) The organizational boundary setting approaches set out in the GHG Protocol are widely adopted and have done much to establish a degree of uniformity of approach. Table 4 below shows the organizational boundary approaches selected by the 402 Global 500 companies that responded to CDP in 2011 for the purposes of reporting scope 1 and scope 2 GHG emissions:

Table 4 – Organizational boundary approaches for reporting Scope 1 and Scope 2 GHG emissions to CDP in 2011

Organizational boundary approach	Number of companies
Equity share	17
Financial control	103
Operational control	244
Other	38
Total	402

46) There is no obvious statistical evidence of trends within sectors. For example, of the 402 Global 500 companies referenced in Table 4 above, 20 are categorized as being in the utilities sector according to the Global Industry Classification Standard. Of those companies, six used the equity share approach, six used the financial control approach and six used the operational control approach, with two companies indicating that they use "other" approaches. Although based on a very small sample, this suggests an even spread of approaches amongst G500 utilities companies.

47) Even where a particular approach is selected, it does not follow that GHG emissions from all activities and entities within the boundary are reported. Of the 402 companies that reported to CDP in 2011, 213 of them said that they had excluded certain sources of GHG emissions from their disclosures. The main reasons given for such exclusions were that information from certain sources and activities was either unavailable or unreliable or that the omitted emissions were estimated to be insignificant or non-material.

48) In the absence of uniform or identifiable approaches to organizational boundary setting, the transparency, reliability and comparability of information is impaired. Common problems include:
   a) How users of information should construct or create performance indicators and intensity metrics where the organizational boundary selected by the company for climate change-related reporting does not align with the basis on which financial or production-related information has been prepared.
   b) Concerns about carbon information "leakage" where the selection of a particular boundary approach results in non-disclosure of certain risks, activities and emissions.

49) In response to these concerns and in order to test appetites for a more targeted approach to organizational boundary setting, CDP issued a draft Framework[33] for public consultation in 2010. The Framework was designed to enhance transparency and consistency in climate change-related reporting and to support benchmarking activities. In response to the question "do you support CDP's introduction of a Framework to limit the approaches that may be taken to certain aspects of climate change-related reporting?" (including organizational boundary setting), the majority of respondents expressed support with qualifications for principles that minimize reporting burdens, harmonize accepted approaches and add further consistency. Although there was some interest in CDP's proposals to limit the number of approaches to organizational boundary setting, respondents were generally opposed to the implementation of a single or limited approach and expressed concerns about deviation from existing and established approaches specified by the GHG Protocol. On this basis, CDP decided not to pursue the development of its Framework pending further relevant research by the Climate Disclosure Standards Board on options for supporting greater consistency in climate change-related reporting.

50) Some respondents to the CDP Framework consultation suggested that approaches to organizational boundary setting should be considered at industry or sector level. Some industries have been considering the most appropriate approach for organizations in their particular sector. For example, the Petroleum Industry Guidelines for Reporting GHG Emissions (Second Edition – May 2011) analyze the implications of different organizational boundary approaches for the petroleum industry as reflected in the extract from the Guidelines in Box 1 below. The Guidelines analyze the relative merits of each organizational boundary approach and recognize the need for reporting on multiple bases pending the development of a single approach.

[33] A report on the public consultation responses is available at www.cdproject.net/Documents/Report-on-CDP-Framework-Public-Consultation.pdf

Box 1 – Extract from the Petroleum Industry Guidelines for Reporting GHG Emissions (Second Edition – May 2011)

3.1.3 Selecting Accounting Based on Equity Share or Control
Petroleum companies may choose to report their corporate GHG emissions based on equity share, operational control, financial control, or on multiple bases. Companies should clearly state in their reporting what method they use. When accounting for GHG emissions, they are encouraged to collect sufficient data to employ both the equity share and operational control methods. Companies that operate in areas where financial control is emerging are also encouraged to collect data on that basis. The reason for these recommendations is that a single method has yet to be established among existing voluntary programmes and emerging mandatory programmes that involve reporting of GHG emissions. Accounting for GHG emissions in multiple ways will ensure that companies are prepared for any programmes in which they may choose, or be required, to participate.

Companies that decide to report only on the basis of equity share or control should recognize the benefits and challenges of each, and choose the method that is most suitable for their activities. They should also recognize that whichever method they choose for their corporate reporting, they may be required to utilize other methods for reporting emissions from specific facilities, activities or geographic areas, depending on the reporting requirements of the programmes in which their individual facilities participate.

Reporting based on the operational control approach is appropriate for:

- *Companies that choose to voluntarily account for and report their corporate emissions in the same way as programmes that involve GHG accounting based on operational control, such as:*
  - *the EU Emissions Trading Scheme. Emissions limitations under the EU Emissions Trading Scheme are imposed at the installation level. For joint ventures, the operator (the firm that manages or controls the installation) is responsible for ensuring compliance with the scheme and reporting emissions, in much the same way as it would be with other environmental regulations.*
  - *Mandatory reporting of GHG emissions in the USA required by either the federal government or state governments, which require reporting at the facility level.*
- *Performance tracking. Having operational control suggests a greater degree of influence than merely holding a share of the equity.*
- *Situations where resources for inventorying emissions are limited. Reporting on the basis of operational control can be expected to be less costly than reporting on the basis of equity share because the reporting company will, by definition, have ready access to the data needed to estimate emissions.*

Reporting based on the financial control approach is appropriate for alignment with financial accounting. Similarly to the equity share approach, the financial control approach results in closer alignment between GHG accounting and financial accounting……it should be noted that the financial control boundary does not include some arrangements that can be common in the petroleum industry and which are equity accounted or proportionally consolidated under international financial reporting standards.

Accounting for GHG emissions based on equity share is appropriate for:

- *Liability and risk management. For the purpose of assessing risks posed to a company, GHG emissions accounting and reporting based on equity share provides a more representative and complete picture. Therefore, it provides a realistic picture of liabilities and risks associated with GHG emissions to management, employees, shareholders and other company stakeholders.*
- *Situations where greater resources are available for conducting the inventory. Reporting on the basis of equity share requires companies to obtain information from other parties for operations they do not control. If this is not possible, they may need to estimate emissions from similar operations for which they have data. In either case, costs may be expected to be greater than for calculating emissions from sources under their operational control.*

The technical challenge is to establish organizational boundary approaches that:

a) Cover the different risks, activities, emissions, etc. about which stakeholders need information, whether these directly affect entities in which the organization has ownership or control, or indirectly affect the organization or its suppliers, customers, resource access, etc., whilst also supporting the need for comparability and benchmarking;
b) Cater for the varying degrees to which an organization might have access to information where the risk, activity or emissions originate outside the entities over which it has ownership or control. This might mean that varying data quality expectations are set for different "boundaries". The GRI's Boundary Protocol states that "a sustainability report should include in its boundary all entities that generate significant sustainability impacts (actual and potential) and/or all entities over which the reporting organization exercises control or significant influence with regard to financial and operating policies and practices..". However, the G3 guidelines also recognize that different relationships involve differing degrees of access to information and the ability to affect outcomes. The GRI therefore distinguishes between "Indicators of Operational Performance", which should include entities over which the organization exercises control and "Disclosures on Management Approach", which should include entities over which the organization exercises significant influence;
c) Acknowledge the boundaries that apply for financial reporting purposes. The ICAEW and UK Environment Agency in their report, *Turning Questions into Answers* contend that: "..reporting boundaries adopted should normally be the same as for financial reporting purposes. Inclusion of information relating to indirect upstream impacts, for example energy use of emissions incorporated in purchased electricity or transportation services or indirect downstream impacts from products after sale, would be inconsistent with other information in financial statements..". This view needs to be balanced with widespread agreement that extended boundaries should be considered when assessing risks to the reporting organization from outside the financial reporting boundary.

Technical challenge – GHG emissions monitoring, measurement and reporting

51) Quantitative measures of greenhouse gas emissions provide direct and immediate information for the understanding and assessment of an organization's climate impacts and performance. However, the perceived and actual differences between schemes can make it difficult to compare results prepared by reference to different scheme rules. Most schemes allow for a variety of approaches to the preparation of GHG emissions results, including how activity data is stored and measured, GHG emissions calculation methods based on emission factors, direct measurement methods (such as continuous monitoring equipment) or a combination of calculation and direct measurement methods.

52) An appreciation of the differences between schemes that require GHG emissions monitoring, measurement and reporting depends on understanding and analyzing:

a) The type of input or activity data that is required and how it is managed (for example, whether input data can consist of quantities of fuel burnt or direct monitoring from instruments on fuel stacks and the frequency with which measurement technology should be calibrated or sample measurements taken);
b) The way in which emissions should be measured from each activity, whether by estimation (using calculation formulae), direct measurement (using continuous emissions measurement technology) or some other approach;
c) The calculation formula to use for each type of gas or activity where estimation applies;
d) The available or required coefficients, such as emission factors and global warming potentials;
e) Quality assurance and control requirements;
f) Expression of or limits for uncertainty in measurement;
g) How to deal with assumptions;
h) Industry-specific approaches (e.g.: for oil and gas, cement, electricity generation etc);

i) How GHG emissions results are to be expressed, e.g.: in metric tons of CO2-e or a unit that is convertible to metric tons of CO2-e.

53) Some of these variations are illustrated in a memorandum commissioned by the US EPA in June 2008 to review the technical characteristics of certain GHG reporting programs and protocols[34]. Table 5 below contains extracts from the memorandum showing how some of the schemes examined in the memorandum deal with certain technical characteristics of GHG emissions reporting from the combustion of fuels.

Table 5 – Extract from Memorandum prepared for the EPA in 2008, comparing characteristics of certain climate change reporting programs/guidelines relating to GHG emissions from the combustion of fuels

Reporting Program or Guidelines	Fuel	Coverage GHGs	Coverage (stationary source types)	Level of reporting	Input data	Points of monitoring	Monitoring or calculation methods
California ARB Mandatory Reporting Rule (proposed)	All fuels	CO2, CH4, N2O	All combustion equipment at affected facilities	Facility	Fuel burned or other operating parameters	Facility or unit fuel supply	Note 1
The Climate Registry	All fuels	CO2, CH4, N2O, HFCs, PFCs, SF6	All combustion equipment at organization's facilities	Facility	Fuel burned or CEMS data	Stack or facility or unit fuel supply	Note 2
US EPA 40 CFR Part 75	All fuels	CO2	Combustion units subject to US Emissions Trading Programs	Unit	Stack gas concentration & flow	Stack CEMS	Note 3
EU Emissions Trading Scheme	All fuels	CO2	All combustion equipment at affected facilities	Facility	Not specified	Facility or unit fuel supply	Note 4

Note 1 – May estimate emissions by using alternative methods of operator's choosing subject to verification team concurrence.
Note 2 – CEMS: Should use data if measured in accordance with 40 CFR Part 75 (see Par 75). Calculation: Preferably measure each unit's fuel use, but may use purchase records. Measure fuel heat and carbon content on a frequency determined by fuel variability to develop emission factors. May also use default fuel-based emission factors. Optional method for CHP facilities to apportion emissions to electric and heat output. To calculate CH4 and N2O emissions, multiply fuel burned y a default emission factor.
Note 3 – CEMS: CO2 or O2 direct CEMS and a stack flow monitor.
Note 4 – Facility may use its own non-tier methods.

[34] ERG memorandum dated June 6, 2008, entitled "Review of Existing Programs" www.erg.com.

54) It is beyond the scope of this Working Paper to examine each one of the elements listed in paragraph 53 and the challenges associated with achieving greater consistency between them. However, one aspect of the measurement process that is explored in more detail here is the application of emission factors for the purposes of calculating GHG emissions results. An emission factor is a conversion factor used to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Using emission factors, particularly default factors, is generally regarded as cheaper and easier than measuring emissions through direct monitoring. However, various studies, including the US EPA's consultation documents on the GHG Mandatory Reporting Rule observe that "default factors mask a high degree of source-specific variability and so can be substantially inaccurate for individual sources and can produce estimates tainted by considerable uncertainty…".[35] Similarly, ERM's study for the European Commission identified inconsistency of emission factors as the main criticism of the GHG Protocol.

55) Research conducted by Amee[36] and reflected in Table 6 below shows the variation in emission factors specified by seven main schemes/data sets in relation to four main fuel sources. The sources of information used for the results are described in Appendix 1.

Table 6 – Research by Amee showing variation in emission factors between seven schemes

Data Set	Natural Gas (gCO2/kWh)	Petrol/Gasoline (gCO2/kWh)	Diesel (gCO2/kWh)	Aviation Turbine Fuel (gCO2/kWh)
DECC	184.850	239.650	250.110	245.550
GHGP	181.764	237.006	253.422	239.400
IPCC	183.600	237.600	254.057	240.000
EPA	181.090	242.018	249.774	236.255
NGA	184.305	240.118	249.118	238.721
CRC	183.600	252.380	263.280	258.370
EIA	181.079	241.897		236.141

Key to acronyms used in Table 6

DECC - Department of Energy and Climate Change
GHGP - Greenhouse Gas Protocol
IPCC - Intergovernmental Panel on Climate Change
EPA - Environmental Protection Agency
NGA - Australian Government National Greenhouse Accounts
CRC - Carbon Reduction Commitment
EIA - U.S. Energy Information Administration

56) For the schemes and sources concerned, Amee concludes that the emission factors are broadly compatible with each other within reasonable errors. The main differences arise from using data from different years (highlighted by the difference between the CRC and DECC values, which have the same source but different years), different countries (highlighted by the NGA and DECC values, which are Australia and UK-specific respectively), and the use of different conversion factors within the calculation (highlighted by the IPCC and GHGP values, which have the same source but use different assumptions for conversion factors).

[35] US EPA "General Monitoring Approach, the Need for Detailed Reporting and other General Rationale Comments" September 2009
[36] www.amee.com

57) Implicit in the values themselves are assumptions, which can result in varying emission factors and GHG emissions results. The most prominent assumption in the case of petrol is the fuel blend that is used. In the case of natural gas, the composition can vary widely depending on geographic region and usage. For example the values in Table 6 are for pipeline quality natural gas.

58) There are important discussions to be had about the roles and needs of each stakeholder in the preparation, reporting and use of GHG emissions information before decisions can be made about the degree to which complete consistency is required in relation to all of the elements that contribute towards the disclosure of GHG emissions results. For example, the proper and necessary efforts of scientists and engineers to agree the most accurate emission factor for converting a measure of a given fuel source into carbon dioxide equivalent tons might be required for certain aspects of measurement. However, agreeing or identifying accurate emissions factors can be a lengthy process that can delay or discourage the preparation of GHG emissions results. Furthermore, depending on the fuel source and the degree to which a corporation is dependent on it, it might not be necessary for an investor to rely on information prepared using that emission factor. In some cases, a deemed or indicative value might suffice and ease reporting burdens for corporations without diluting meaning for investors. The technical challenge is to find the appropriate balance between technical accuracy, cost and communication effectiveness in the preparation and use of GHG emissions results that satisfies the needs of all stakeholders.

Technical challenge – accounting for carbon instruments

59) Countries that have introduced cap and trade schemes have not in all cases specified how permits issued under those arrangements should be characterized or accounted for (e.g.: as current assets (inventory) or intangible assets) in financial statements. For example, since the inception of the EU Emissions Trading Scheme in 2005[37], research shows that in the absence of a single standard, a diverse and inconsistent range of accounting models has been allowed to flourish on how to account for emissions allowances delivered under that scheme. As a result, comparable information about the relative performance of firms cannot be discerned from carbon-related disclosures. Research[38] commissioned in 2008 by British Prime Minister Gordon Brown discusses how the absence of a standard for the measurement and reporting of allowances and other instruments relating to emissions trading schemes can have far-reaching consequences for markets and behavior.

60) The IASB recognizes the "void in authoritative guidance" that has existed since IFRIC 3 *Emission Rights* was withdrawn[39]. The allocation of emissions allowances for free has, in part, encouraged variations in accounting and disclosure by companies and lack of certainty in reporting. Phase 3 of the EU Emissions Trading Scheme, which commences in 2013 and runs until 2020, will introduce auctioning of emission allowances. In accounting terms, this marks an important transition for scheme participants because they will no longer be able to recognize emission allowances at a nominal amount (being zero) as they were when granted for free.

[37] Lovell, H., T. Sales de Aguiar, et al. (2010) *Accounting for Carbon* - ACCA & IETA Research Report 122; PricewaterhouseCoopers and the International Emissions Trading Association (2007) *Trouble-entry Accounting Revisited*.
[38] Global Carbon Trading: A Framework for Reducing Emissions, Mark Lazarowizcz , July 2009 and Global Carbon Market Institutions – An Assessment of Governance Challenges and Functions in the Carbon Market, Michael Mehling, Ecologic Institute
[39] For the full history of the project see IASB's website or Deloitte's February 2007 publication "Accounting for Emission Rights"

61) The challenge is to devise consistent accounting practices that:
   a) Apply to both initial recognition and ongoing measurement of emissions permits;
   b) Prevent the incidence of artificial income shifts for participants in trading schemes;
   c) Address the way in which emissions allowances should be accounted for where they are acquired, held and sold by non-participants who can acquire allowances for trading, investment, or speculative purposes.
   d) Deal with the accounting treatment of carbon derivatives as part of hedging strategies under the EU ETS.

Communication challenge – Key Performance Indicators

62) Performance indicators and intensity metrics enable users of information to evaluate and compare corporate performance by reference to standardized variables. Whereas "total" emissions refers to the actual amount of GHGs produced by an organization, emissions intensity refers to the ratio of GHGs produced to a financial measure (e.g. turnover or profit), or to a measure of activity (e.g. per metric ton or unit of output).

63) There are various types of quantitative performance indicators, including:
   a) **Generic and industry-specific** - Generic indicators can be applied globally across all enterprises and sectors. Industry-specific indicators take the specific environmental profile of a sector into account.
   b) **Physical and economic** – Physical performance indicators are based on a quantity of product or activity output. According to the GHG Protocol, "a physical intensity ratio is suitable when aggregating or comparing across businesses that have similar products. An economic performance measure is based on a financial metric and is suitable when aggregating or comparing across businesses that produce different products.

64) Corporations to which the European Union Modernization Directive applies are required to use environmental (and social and governance) KPIs to make disclosures required under the Directive. The requirement states that: "To the extent necessary for an understanding of the company's development, performance or position, the analysis shall include both financial and, where appropriate, non-financial key performance indicators relevant to the particular business, including information relating to environmental and employee matters."

65) Various organizations, including DEFRA, the GRI, UNCTAD, Accounting for Sustainability, DVFA/EFFAS, Keindanren in Japan, the Institutional Investor Group on Climate Change and the UK Carbon Trust have developed indicators to be used for climate change and sustainability reporting and benchmarking. However, there is an absence of standardized, globally accepted performance indicators. The 402 companies that responded to CDP in 2011 cite between them the use of 136 types of intensity metric. There is evidence (as illustrated in Table 7) of some industry coalescence around particular metrics and indicators, such as metric tons of CO2-e per barrel of oil equivalent in the oil and gas sector and metric tons of CO2-e per megawatt hour of energy in the electric utilities sector.

Table 7 – Sectoral trends in Performance Indicators

Sector	Metric	Source
Integrated oil and gas	Per metric ton of output broken down for: • Exploration and production • Refining • Petrochemicals	GHG Protocol
Transport	Per revenue metric ton kilometer broken down by product category	CDP
Beverages	Per liter broken down by clean and waste water respectively	CDP
Telecommunications, internet software and services	Per gigabyte transmitted broken down by category Kg CO2 per production volume and products (eg: per operating hour)	CDP Hesse/Deloitte 2008
Electric utilities	Metric tons CO2-e/GWh by country and fuel type Group-wide GHG intensity of energy production in g CO2/kWh on the basis of thermically and electrically generated energy; indication of acquisition or sale of emission allowances. Metric tons CO2/MWh generated or delivered to customers	Insight Investment & CDP The Climate Registry EPS Protocol
Cement	Net CO2 emissions kg/ton cementitious material	WBCSD cement supplement
Aluminum	GHGs (excluding energy) per ton of aluminum	WRI Target:intensity referencing Voluntary Aluminum Industry Partnership
Automobile manufacturing	GHGs per vehicle produced Sales-weighted fleet consumption of types of vehicles sold in the fiscal year in g CO2\km (EU) or miles per gallon (USA) Group-wide energy and greenhouse gas intensity of the production in kg CO2 per produced vehicle	WRI Target:intensity referencing Alliance of Automobile Manufacturers Hesse/Deloitte 2008 Hesse/Deloitte 2008
Chemicals	GHG per unit production	WRI Target: intensity referencing American Chemistry Council and Hesse/Deloitte 2008
Steel	Energy per ton steel produced	WRI Target: Intensity referencing American Iron and Steel Institute

66) In the absence of standardized performance indicators, the European Combined Reporting Alliance for ESG coalition, Eurosif and others have called for KPIs to be agreed and formalized and reflected in a generally accepted framework by 2012, ideally aligning financial and non-financial KPIs. The US-based Sustainability Accounting Standards Board[40] (SASB) intends to create industry-specific KPIs that are based on the relative materiality of sustainability issues by industry and that are suitable for making disclosures in 10-K Forms. The development by the WRI and WBCSD of the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard published in October 2011 provides a standard framework for the communication of GHG emissions results and performance indicators according to fifteen defined categories of indirect GHG emissions.

67) The technical and communications challenge is to devise non-financial KPIs that are:
   a) Consistent or standardized by sector;
   b) Constructed according to common and consistent methodologies;
   c) Disclosed on a consistent basis from year to year;
   d) Representative of and consolidate existing good practice;
   e) Sufficiently flexible to take into account any changes a company might undergo.

Technical challenge – review and assurance

68) As a new discipline, the development of climate change-related reporting is an iterative process. As practices, theories, rules and methodologies are constantly developed, these need to be reviewed to determine whether they make sense, are accurate, can help other reporters and/or should be published as good practice. Similarly, the review process helps to identify any poor or unhelpful practices that should be discouraged.

69) Arguably insufficient time and attention is devoted to in-depth examination of disclosures to find out whether they are accurate, consistent (year on year), make sense, satisfy stakeholder needs and compliance requirements and are capable of being assured or verified (whether they are or not in practice).

70) The challenge is to establish a review mechanism that sense checks the link between reporting frameworks, information produced and the effectiveness of action. Such review procedures could also help to make the crucial link between reporting and action by assessing the overall effects of actions taken by organizations in response to internal strategies and stakeholder pressures to ensure that no perverse outcomes or results are produced.

71) Such a mechanism should enable stakeholders to challenge organizations about their disclosures and associated actions in such a way as to align the interests of reporters and information users and accelerate improvements in disclosure. For example, the UK Financial Reporting Review Panel has challenged[41] a number of companies where:
   a) The directors' report does not clearly identify the principal risks and uncertainties facing the business;
   b) The description of the risk or uncertainty is expressed in generic terms so that it is not clear how the risk or uncertainty applies to the company's particular circumstances;
   c) Principal risks and uncertainties disclosed are not consistent with other information given in the report and accounts;

[40] www.sasb.org
[41] FRRP PN 130 1 February 2011 – The Financial Reporting Review Panel highlights challenges in the reporting of principal risks and uncertainties

d) Disclosures do not state how the company manages it principal risks and uncertainties

72) Similarly, unpublished research by Carbonmetrics highlights trends in the disclosures to CDP of 175 carbon-intensive companies. All of the companies reported exposure to regulatory risks and assessed the financial effects of climate change on their business. However, 43 of those companies do not make an emission forecast, 35 do not have a reduction plan in place and 26 do not have a quality assurance/quality control "QA/QC" system to ensure the accuracy of calculated emissions. There are 22 companies that publish opportunities that climate change brings to their business and assess the financial consequences of climate change for their business. However, they do not have an investment plan.

73) Various organizations have a role to play in the process of reviewing climate change-related information, including formal organizations such as the Financial Reporting Review Panel, which examines information in annual reports, and indices such as UBS' "ESG analyzer". Some regulatory agencies, such as the Australian Council of Super Investors (ASIC) regularly review the sustainability reporting practices of organizations. The ASIC's review of sustainability reporting practices of S&P/ASX 200 companies as at 31 March 211 was designed, amongst other things, to provide investors with insight on whether sustainability risks are being adequately disclosed by index constituents and to illustrate the collective improvement (or otherwise) of disclosures made by companies in regards to sustainability. This type of review process supports a dynamic cycle of information provision and reaction from stakeholders that, over time, could lead to alignment of their needs and expectations, including through the development of standards, rules and guidance to improve the overall accuracy and usefulness of reported information.

74) Assurance and verification complements review processes by providing investors and others with an independent opinion (in the form of assurance or verification) about the validity of information. Like greenhouse gas reporting schemes themselves, assurance and verification practices are under development although the International Organization for Standardization's ISO 14064-3 has been in place since 2006 and is widely used. There is variation between greenhouse gas reporting schemes in relation to the quality assurance, verification and control provisions they specify. Some of the mandatory schemes, for example the USA Mandatory Reporting Rule, rely on self-certification of data, others rely on selected audits to check quality. Some schemes, including those below require third party verification of data.

Schemes requiring third-party verification of GHG emissions information[42]

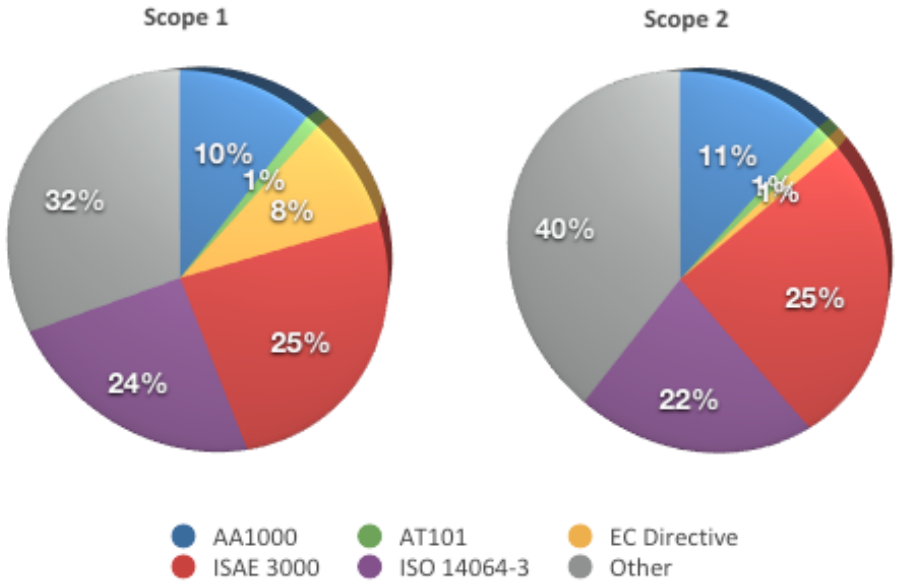
a) The California Air Resources Board (CARB) GHG Reporting Program;
b) The Climate Registry
c) The Western Climate Initiative
d) The EU Emissions Trading Scheme (EU ETS)
e) Alberta's Specified Gas Emitters Program
f) British Columbia's Greenhouse Gas Reduction Act
g) Ontario Regulation 452/09 Greenhouse Gas Emissions Reporting

75) Of the Global 500 companies that reported to CDP in 2011, 139 reported that their direct GHG emissions data had been independently verified by a third party and that the verification exercise was complete as at the time of reporting to CDP. 28 companies said that verification of direct GHG emissions data was underway at the time of reporting. However, the assurance is provided by reference to a variety of standards and by a variety of service providers. The assurance/verification standards cited include those listed below.

[42] List sourced from The Climate Registry

a) AccountAbility's AA 1000 assurance standard;
b) International Standard on Assurance Engagements (ISAE) 3000;
c) The EU Emissions Trading Scheme Monitoring and Reporting Rules 2003/87/EC and amendments;
d) The International Organization for Standardization's ISO 14064-3:2006;
e) Attest Engagements 101

76) CDP information suggests that ISAE 3000 and ISO 14064 are the most widely used assurance/verification standards as illustrated in the diagrams below.



77) In June 2012 the International Auditing and Assurance Standards Board issued International Standard on Assurance Engagements (ISAE) 3410, "Assurance Engagements on Greenhouse Gas Statements". ISAE 3410 is a topic-specific assurance standard that provides requirements and guidance specific to engagements on GHG statements. The objective of the standard is to enhance the quality and consistency of assurance engagements reporting on GHG statements prepared as part of a regulatory disclosure regime or as part of an emissions trading scheme or to inform investors or others on a voluntary basis.

Part III Conclusions

78) As the above examples illustrate, the challenges associated with advancing greater consistency in climate change-related disclosure are already being addressed to some extent by private sector activity and collaboration between interest groups and governments. Whilst helpful, much of this activity is itself fragmented through a focus on particular industries, sector groups or countries.

Working Paper Conclusions

"the world cannot go back to business as usual, with its emphasis on unbridled short-term economic growth at the expense of overall global health. Nor can the higher-level challenges of a globally interconnected economy or oversight of the taken-for-granted boundaries of the natural life support systems of the earth be met simply at the local, national or regional level[43]*.."*

79) Although the mandatory and voluntary schemes that have emerged against different policy backgrounds vary, they also share some fundamental characteristics reflecting the similar policy objectives they are designed to serve, (e.g.: emission reductions, achievement of national targets and low-carbon strategies, etc.). Furthermore, the reporting content required by many reporting schemes is very similar. The evolution of regulatory frameworks has formalized aspects of climate change-related disclosure and some of the infrastructure is in place or developing fast to ensure that essential information reaches policy makers and markets and companies are building capacity to make climate change-related disclosures. Non-governmental organizations, such as CDP and GRI and voluntary standards such as the GHG Protocol and its Programs around the world have also done much to build capacity, and encourage and provide the structural architecture for climate change-related disclosure. The GHG Corporate Standard is widely used for preparing corporate GHG inventories and reporting GHG emissions. Many other voluntary schemes and initiatives are based on the GHG Protocol[44]. In the same way that global structures, such as the International Accounting Standards Board, the UN Project on Principles for Responsible Investment and the World Federation of Exchanges provide the international architecture around which national initiatives can develop, coalesce and consolidate global non-governmental organizations such as the World Business Councils for Sustainable Development, the World Resources Institute, CDP and GRI provide a focus for the development of global solutions that sometimes elude governmental organizations. Common features of national and regional climate disclosure approaches provide a strong basis from which further consistency in reporting could develop over time.

80) Building on those common features and the work of coalitions that advance greater consistency of approach to climate change-related reporting will require increased cooperation at international level. Interested parties wait with hopeful expectation of conclusions from the Rio +20 Conference that will support activities to encourage greater consistency of approach to climate change-related disclosure.

[43] Beyond the Financial Crisis – The Institute of Science, innovation and Society Futures Group of Oxford University
[44] see www.ghgprotocol.org/standards/corporate-standard/users-of-the-corporate-standard

Appendix 1

The DECC data presented here are taken from the 2010 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting. The figures used are Gross Energy Values for Natural Gas, Petrol, Diesel and Aviation Turbine Fuel.

The GHGP data are sourced from the GHGP's GHG Emissions from Stationary Combustion Worksheet 2010, v.4.0. This worksheet states that the source of its data is the 2006 IPCC National Greenhouse Gas Inventories, Volume 2, Chapter 2, Tables 2.2-2.5. The values quotes were given in LHV terms in units of kgCO2/TJ. This was converted using the sheet's recommendation of dividing by 1,000,000,000 and multiplying by 3500 to convert from per TJ to per kWh. Converting from net to gross is done by dividing the LHV value by 1.11111111 for gases and 1.05263157894737 for liquids, as recommended in the worksheet. When converting between units rounding differences can have a significant impact on the end figure; in this case no values were rounded until the end of the calculation.

The IPCC data are from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories Chapter 2. The values used are from the "Energy" table using the Natural Gas, Motor Gasoline, Gas/Diesel Oil and Aviation Gasoline entries, with units of kgCO2/TJ LHV. The IPCC states the conversion between LHV and HHV values is 10% for gases and 5% for liquids; these are the values that have been used in this report to convert the IPCC values from LHV to the HHV values presented in this report. There is no recommended conversion between TJ and kWh in the IPCC report, so the same conversion as used above, for the GHGP values, has been used here. If the same conversion factors for heating values and units were used for both the GHGP and IPCC values, they would be identical.

The EPA National Gas data are from the EPA Climate Leaders Direct Emissions from Stationary Combustion Sources 2008. The Natural Gas carbon dioxide heat contents are sourced from the Annual Energy Review 2006, EIA; Carbon Content Coefficients and Fractions Oxidized are sourced from the Inventory of US Greenhouse Gas Emissions and Sinks 2007, EPA. The values for Aviation Gasoline, Motor Gasoline and Diesel are from the EPA Climate Leaders Direct Emissions from Mobile Combustion Sources. The emission factors were converted from per gallon to per kWh using the given HHV values, along with the following conversion factors: 1barrel = 42gal, 1mmBTU(95) = 1.054804GJ, 1J = 2.778e-7kWh. It is vital to state how these factors are converted, since a minimal difference in conversion factor can results in a significantly different end value.

The NGA Australia-specific factors quoted in this report are from the Australian Government Department of Climate Change and Energy Efficiency National Greenhouse Accounts (NGA). They are the emission factors quoted for stationary combustion. This report states the source of its factors to be the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1).

The Carbon Reduction Commitment (CRC) data is from the CRC Energy Efficiency Scheme Order: Table of Conversion Factors. The CRC source their data directly from the 2009 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting. The values presented in this report are those for Natural Gas (used for any gas supplied through the national grid network), Petrol, Diesel and Aviation Turbine Fuel.

The EIA data comes from the EIA Documentation for Emissions of Greenhouse Gases in the United States 2005, 2007. They state the source of their Natural Gas data as the Gas Technology Institute database and the EIA Monthly Energy Review, Table A4, and the EIA State Energy Data Report Table 1 and 2. The Motor Gasoline value is sourced from the National Institute for Petroleum and Energy Research and the American

Petroleum Institute and the EIA, Annual Energy Review 2000 Appendix A. The Aviation Gasoline value is sourced from the American Society for Testing and Materials, ASTM and Other Specifications for Petroleum Products and Lubricants and the EIA Annual Energy Review (various years).