RESPONSIBLE BUSINESS CONDUCT

CLIMATE CHANGE DISCLOSURE IN G20 COUNTRIES

Stocktaking of corporate reporting schemes

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ABBREVIATIONS

OECD	Organisation for Economic Cooperation and Development
CDSB	Climate Standards Disclosure Board
IPCC	Intergovernmental Panel on Climate Change
WBCSD	World Business Council for Sustainable Development
GRI	Global Reporting Initiative
IIRC	International Integrated Reporting Council
SASB	Sustainability Accounting Standards Board
GHG	Greenhouse Gas
Defra	Department for Environment, Food and Rural Affairs
KPI	Key performance Indicator
EU	European Union
CSR	Corporate Social Responsibility
CO2	Carbon Dioxide
CH4	Methane
SF6	Sulphur Hexafluoride
HFC	Hydrofluorocarbons
PFC	Perfluorinated Compounds
N20	Nitrous Oxide

FOREWORD

This report takes stock of mandatory climate change reporting schemes in G20 countries and identifies commonalities and divergences between the various schemes.

The research underlying this report was undertaken as part of the project *Aligning Policies for the Transition to a Low-carbon Economy*, conducted jointly by the OECD, the International Energy Agency, the International Transport Forum and the Nuclear Energy Agency, which analyses possible misalignments between existing policy frameworks and climate policy objectives. The report also builds on work undertaken in the context of the chapter on Disclosure of the OECD Guidelines for Multinational Enterprises.

The report has been prepared in cooperation between the Organisation for Economic Cooperation and Development (OECD) and the Climate Disclosure Standards Board (CDSB). For the OECD, the work was led by Cristina Tébar Less, Head of the Responsible Business Conduct Unit, Directorate for Financial and Enterprise Affairs, with the support of Barbara Bijelic, Policy Analyst. The CDSB research team comprised Lois Guthrie (Founding Director), Luke Blower (Technical Officer) and Matthew Slate (Project Officer).

EXECUTIVE SUMMARY

The importance of corporate disclosure for the climate change infrastructure

Engagement with business and the private sector is crucial to the successful design, financing and implementation of measures to address climate change whilst meeting sustainable development goals and achieving economic growth. Tackling the risks of climate change requires integrating climate into core decision-making processes at all levels of government, business and financial institutions. The supply by business of reliable climate change related information is crucial to that process.

Corporate climate change disclosure thus forms part of the infrastructure for providing decision-makers with information that will enable them to integrate climate considerations into their analyses, and to help better align business practice with climate change mitigation and adaptation plans and sustainable development goals.

There is no universally agreed definition of "corporate climate change-related information", but generally it includes details of some or all of the following:

- The strategies, governance practices and policies implemented by companies to mitigate, adapt to and manage climate change impacts including extreme weather events, resource shortages and changing market conditions;
- Resource consumption that affects climate change, including that of fossil fuels;
- Production of waste and pollutants that affect the climate including greenhouse gas (GHG) emissions;
- The principal risks and opportunities expected by the company as a result of climate change, for example, demand for new products, regulation related to climate, increased costs to transition to a low carbon economy, and supply chain resilience.

Climate change related information is reported to a wide range of audiences such as governments, investors, large purchasing organisations, advocacy groups and civil society. The information can be used for multiple purposes, including to inform consumer decisions, assessment of performance against policy objectives, investment analysis and risk analysis. Companies themselves also use the information to derive benefits including increased awareness of climate related risks and opportunities, streamlining of processes, cost reductions and improved efficiency and mitigation or reversal of negative climate impacts.

Since the late 1990s a multitude of mandatory and voluntary government schemes have emerged which, together with non-governmental initiatives, require or encourage enterprises to measure and report their greenhouse gas (GHG) emissions and disclose other climate-related information. As a result, businesses are under growing pressure from multiple stakeholders (consumers, investors and governments) to increase the quantity, quality and availability of climate change related information. Increased corporate disclosure of climate change related information is a welcome development and in line with governments' expectations for responsible business conduct, as reflected, for example, in the chapter on disclosure of the OECD Guidelines for Multinational Enterprises. However, the multiplicity of

different reporting schemes, and the varying requirements on the quality and content of reported information poses challenges to reporting companies and users of the information, including investors, and weakens the comparability of data.

Corporate climate change-related reporting schemes in G20 countries – overview and challenges

The majority of G20 countries (15) have some kind of mandatory corporate reporting scheme in place or in preparation, that requires disclosure of some or all of the climate change related information described above.[1] The analysis of the key features of mandatory climate change reporting schemes in G20 countries reveals both significant differences and commonalities.

Climate change reporting schemes in G20 countries: key features

15	G20 countries have a mandatory corporate climate change reporting scheme
15	schemes require reporting of direct GHG emissions (scope 1)
6	schemes require reporting of emissions related to consumption of purchased energy (scope 2)
0	schemes require reporting of indirect emissions (scope 3)
4	schemes encourage reporting of indirect emissions
9	schemes encourage reporting of information other than GHG emissions (e.g. risks, strategy)
15	schemes apply to companies within national boundaries
2	schemes also apply beyond national boundaries
12	schemes require verification of information
12	schemes provide penalties for non-compliance
14	schemes specify methods of GHG emissions calculation
12	schemes provide reporting guidance

1 For the purposes of this analysis, a "scheme" may include one single piece of legislation or a package of measures introduced by a government, which may include the legislative provision(s) containing the reporting requirements and associated material designed to support the implementation of these requirements.

The 15 G20 countries with mandatory schemes in place require companies to report their direct (Scope 1) GHG emissions, 6 require reporting of emission related to energy consumption (Scope 2) and none of the schemes mandates reporting indirect (Scope 3) emissions, although 4 of them encourage it. Depending on their particular sector, direct GHG emissions (Scope 1) and emissions related to energy use (Scope 2) represent a small proportion of organisations' overall carbon footprints compared with Scope 3 GHG emissions, i.e., indirect emissions, including those produced through the supply chain. Schemes requesting disclosure of other climate information such as on corporate risks and opportunities associated with climate change and strategies to address risks are relatively rare.

Reporting of other types of climate change related information, such as exposure to climate risks, strategies to reduce emissions (including emission targets) and to address risks is required in a limited number of countries, including Canada, South Korea, and the US.

All schemes in G20 countries apply only to facilities and/or corporations that operate in or are registered in the country concerned, with the exception of the UK and South African schemes, which extend reporting requirements to also cover companies registered or operating outside their jurisdiction, in particular, to subsidiaries quoted companies.

Most G20 schemes require some form of verification, although the types and levels of verification vary. Of the 12 schemes, 2 require independent, third party verification and, 7 mandate that the verification provider should hold some form of accreditation as well.

Some form of penalty (mostly monetary fines) for non-conformance is included in 12 schemes, including Australia, Canada, and South Korea. Some, e.g., the EU scheme, apply on a "comply or explain" basis, where companies that do not comply and do not satisfactorily explain why, may be subject to legal action by shareholders and other groups.

The thresholds and criteria that determine which facilities and/or entities are within scope of schemes vary significantly among schemes. They include criteria such as the extent of GHG emissions, the number of employees, the industrial sector, and the type of reporting entity.

The reporting schemes in 14 G20 countries include specific guidance on which GHG emission calculation methods should be used by reporting companies. A variety of calculation methods (many of which are produced by private sector organisations) are mentioned in the different schemes, for example the GHG Protocol, and ISO 14064-1. In some cases the scheme specifies how GHG emissions are to be calculated – for example in the US (Mandatory Reporting of GHG Rules) and Australia (NGER).

Several schemes (14) provide guidelines to facilitate reporting, which form part of the overall climate reporting scheme (e.g., the UK, France, Japan and South Korea).

Overall, most reporting schemes in G20 require only a fraction of companies' climate change related information, focussing mainly on reporting (direct) GHG emissions. By contrast, CDP, a non-governmental reporting scheme, requests the full range of climate change information from companies and makes the reported information public for use by decision-makers. This suggests that there is some divergence between the range of information companies are willing and able to report under voluntary schemes, and the limited information requested by most governmental schemes, suggesting that policy makers have an opportunity to harness the reporting capacity and experience that has been built over the years.

Whilst significant developments are being made in corporate climate change reporting, it remains a relatively young discipline facing multiple challenges associated with the fragmentation and diversity of reporting requirements, the complexity of reporting through the value chain, immature verification arrangements for non-financial information and disparity of routes through which information can be reported, all of which may limit the effective use of corporate climate change information in decision-making.

I. KEY ASPECTS OF CORPORATE CLIMATE CHANGE DISCLOSURE

The importance of corporate disclosure for the climate change infrastructure

Engagement with business and the private sector is crucial to the successful design, financing and implementation of measures to address climate change, to achieve the transition to a low carbon economy and meet sustainable development goals. The relationship between business activity and climate change is reflected, inter alia, in increasing demand for more and better corporate climate change-related information and the associated rise of corporate climate change reporting schemes.

The political context against which corporate climate change reporting schemes are established is complex. The work of the Global Commission on the Economy and Climate and, in particular, its New Climate Economy Report (2014) gives insight into this context. The Commission was established to examine whether it is possible to achieve lasting economic growth while also tackling the risks of climate change. The New Climate Economy Report concludes that both are possible if supported by structural and technological changes, flow of investment for innovation, strong political leadership and credible, consistent policies. The report also proposes a ten-point Global Action Plan of key recommendations, the first of which is to accelerate low-carbon transformation by integrating climate into core decision-making processes at all levels of government and business.

In an effort to build that infrastructure and strengthen the drive towards greater corporate transparency and effective management of climate change, growing numbers of governments are developing both mandatory and voluntary schemes requiring disclosure of corporate climate change related information. In addition, a range of non-governmental organisations have introduced voluntary reporting initiatives and enabling mechanisms including platforms and systems for the delivery and dissemination of information, reporting frameworks and guidance.

Corporate climate change disclosure forms part of the infrastructure for providing decision-makers with information that will enable them to integrate climate considerations into their analyses, and to help better align business practice with climate change mitigation and adaptation plans and sustainable development goals.

Since the late 1990s a large number of mandatory and voluntary government schemes have emerged which, together with non-governmental initiatives, require or encourage enterprises to measure and report their greenhouse gas (GHG) emissions and disclose other climate-related information. The majority of G20 countries have now some kind of corporate reporting scheme in place that requires disclosure of climate change related information.

As a result, businesses are under growing pressure from multiple stakeholders (for example consumers, investors and governments) to increase the quantity, quality and availability of climate change related information. While increased corporate disclosure of climate change related information is a welcome development and in line with governments' expectations for responsible business, as reflected, for example, in the OECD Guidelines for Multinational Enterprises (Box 1), the multiplicity of different reporting schemes may pose challenges to companies, and weakens the comparability of data.

Box 1. OECD Guidelines for Multinational Enterprises (2011): Chapter on Disclosure

1. Enterprises should ensure that timely and accurate information is disclosed on all material matters regarding their activities, structure, financial situation, performance, ownership and governance. This information should be disclosed for the enterprise as a whole, and, where appropriate, along business lines or geographic areas. Disclosure policies of enterprises should be tailored to the nature, size and location of the enterprise, with due regard taken of costs, business confidentiality and other competitive concerns.

2. Disclosure policies of enterprises should include, but not be limited to, material information on:

a) the financial and operating results of the enterprise;

b) enterprise objectives;

c) major share ownership and voting rights, including the structure of a group of enterprises and intra-group relations, as well as control enhancing mechanisms;

d) remuneration policy for members of the board and key executives, and information about board members, including qualifications, the selection process, other enterprise directorships and whether each board member is regarded as independent by the board;

e) related party transactions;

f) foreseeable risk factors;

g) issues regarding workers and other stakeholders;

h) governance structures and policies, in particular, the content of any corporate governance code or policy and its implementation process.

3. Enterprises are encouraged to communicate additional information that could include:

a) value statements or statements of business conduct intended for public disclosure including, depending on its relevance for the enterprise's activities, information on the enterprise's policies relating to matters covered by the *Guidelines*;

b) policies and other codes of conduct to which the enterprise subscribes, their date of adoption and the countries and entities to which such statements apply;

c) its performance in relation to these statements and codes;

d) information on internal audit, risk management and legal compliance systems;

e) information on relationships with workers and other stakeholders.

4. Enterprises should apply high quality standards for accounting, and financial as well as non-financial disclosure, including environmental and social reporting where they exist. The standards or policies under which information is compiled and published should be reported. An annual audit should be conducted by an independent, competent and qualified auditor in order to provide an external and objective assurance to the board and shareholders that the financial statements fairly represent the financial position and performance of the enterprise in all material respects.

Commentary on Disclosure

The purpose of this chapter is to encourage improved understanding of the operations of multinational enterprises. Clear and complete information on enterprises is important to a variety of users ranging from shareholders and the financial community to other constituencies such as workers, local communities, special interest groups, governments and society at large. To improve public understanding of enterprises and their interaction with society and the environment, enterprises should be transparent in their operations and responsive to the public's increasingly sophisticated demands for information.

The information highlighted in this chapter addresses disclosure in two areas. The first set of disclosure recommendations is identical to disclosure items outlined in the OECD Principles of Corporate Governance. Their related annotations provide further guidance and the recommendations in the *Guidelines* should be construed in relation to them. The first set of disclosure

recommendations may be supplemented by a second set of disclosure recommendations which enterprises are encouraged to follow. The disclosure recommendations focus mainly on publicly traded enterprises. To the extent that they are deemed applicable in light of the nature, size and location of enterprises, they should also be a useful tool to improve corporate governance in nontraded enterprises; for example, privately held or State-owned enterprises.

Disclosure recommendations are not expected to place unreasonable administrative or cost burdens on enterprises. Nor are enterprises expected to disclose information that may endanger their competitive position unless disclosure is necessary to fully inform the investment decision and to avoid misleading the investor. In order to determine what information should be disclosed at a minimum, the *Guidelines* use the concept of materiality. Material information can be defined as information whose omission or misstatement could influence the economic decisions taken by users of information.

The *Guidelines* also generally note that information should be prepared and disclosed in accordance with high quality standards of accounting and financial and non-financial disclosure. This significantly improves the ability of investors to monitor the enterprise by providing increased reliability and comparability of reporting, and improved insight into its performance. The annual independent audit recommended by the *Guidelines* should contribute to an improved control and compliance by the enterprise.

Disclosure is addressed in two areas. The first set of disclosure recommendations calls for timely and accurate disclosure on all material matters regarding the corporation, including the financial situation, performance, ownership and governance of the company. Companies are also expected to disclose sufficient information on the remuneration of board members and key executives (either individually or in the aggregate) for investors to properly assess the costs and benefits of remuneration plans and the contribution of incentive schemes, such as stock option schemes, to performance. Related party transactions and material foreseeable risk factors are additional relevant information that should be disclosed, as well as material issues regarding workers and other stakeholders.

The *Guidelines* also encourage a second set of disclosure or communication practices in areas where reporting standards are still evolving such as, for example, social, environmental and risk reporting. This is particularly the case with greenhouse gas emissions, as the scope of their monitoring is expanding to cover direct and indirect, current and future, corporate and product emissions; biodiversity is another example. Many enterprises provide information on a broader set of topics than financial performance and consider disclosure of such information a method by which they can demonstrate a commitment to socially acceptable practices. In some cases, this second type of disclosure – or communication with the public and with other parties directly affected by the enterprise's activities – may pertain to entities that extend beyond those covered in the enterprise's financial accounts. For example, it may also cover information on the activities of subcontractors and suppliers or of joint venture partners. This is particularly appropriate to monitor the transfer of environmentally harmful activities to partners.

Many enterprises have adopted measures designed to help them comply with the law and standards of business conduct, and to enhance the transparency of their operations. A growing number of firms have issued voluntary codes of corporate conduct, which are expressions of commitments to ethical values in such areas as environment, human rights, labour standards, consumer protection, or taxation. Specialised management systems have been or are being developed and continue to evolve with the aim of helping them respect these commitments – these involve information systems, operating procedures and training requirements. Enterprises are cooperating with NGOs and intergovernmental organisations in developing reporting standards that enhance enterprises' ability to communicate how their activities influence sustainable development outcomes (for example, the Global Reporting Initiative). Enterprises are encouraged to provide easy and economical access to published information and to consider making use of information technologies to meet this goal. Information that is made available to users in home markets should also be available to all interested users.

Enterprises may take special steps to make information available to communities that do not have access to printed media (for example, poorer communities that are directly affected by the enterprise's activities).

Source: OECD Guidelines for Multinational Enterprises http://mneguidelines.oecd.org

A multitude of corporate climate change reporting schemes

Research by the Climate Disclosure Standards Board (CDSB) based on a sample of national and international developments on reporting suggests that there are almost 400 different provisions, products or offerings that directly or indirectly affect reporting of complementary information.[2] The provisions concerned do not all focus specifically on climate change or climate change related reporting. However, they all influence – directly or indirectly – companies' behaviour or reporting practice on sustainability of which climate change related information is a sub-set. Included in the list are advocacy campaigns, platforms for registering sustainability commitments, guidance, policies, ratings schemes, laws and measurement tools. The focus of the provisions can be very wide (e.g., on sustainability reporting for all companies) or very narrow on a particular industry (e.g., insurance) or a particular product range or theme (such as sustainability in food or energy production or forest impacts). What they share is an influence on sustainability reporting or the underlying behaviour that is being reported.

The types of information that are requested under climate reporting schemes include:

- **GHG emissions** (including through production of waste and pollutants);
- **Consumption of resources and energy** that affect climate change (e.g. fossil fuels);
- The **strategy, governance practices and policies** implemented by companies to mitigate, adapt to and manage climate change impacts including extreme weather events, resource shortages, changing market conditions etc.;
- **Performance** (e.g. in reducing emissions) against targets
- The principal **risks and opportunities** expected by the company as a result of climate change, for example, demand for new products, regulation related to climate, increased costs to transition to a low carbon economy, and supply chain resilience.

There are very few single schemes that ask for the complete range of information. Government schemes tend to focus on requesting quantitative information about a company's energy consumption and GHG emissions. In some countries there might also be requirements in securities law to report on principal risks, which includes climate risk to the extent such risks are material to the company.

By contrast, there are some not for profit and specialised organisations including CDP and the Global Reporting Initiative (GRI) that encourage companies to report on the full set of climate change related information listed above. CDP asks for all of elements of climate change-related information through a structured annual process. GRI also asks for the information as part of a wider set of sustainability information. CDP and GRI's approaches may also be used to prepare a "Communication of Progress" under the UN Global Compact.[3] CERES encourages provision of this information through various channels.[4] Finally, if the Integrated Reporting Framework's reference to "natural capital" is interpreted as including all of the above, then it too encourages disclosure of this information. Some provisions or products such as standards offered by the International Organisation for Standardisation

2 www.wbcsd.org

3 www.unglobalcompact.org

4 www.ceres.org

(ISO) and the GHG Protocol developed by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI), focus on providing guidance about how to comply with reporting requirements or undertake necessary preparatory work – for example – how to prepare a GHG emissions inventory. The initiatives all contribute necessary pieces of infrastructure to the wider system of reporting.

An OECD working paper (Kauffmann, Tébar Less et al, 2012) identified the "building blocks" of corporate climate change reporting schemes; some of them concerning companies, others concerning the government (see Table 1). Building blocks include:

- ***Scope and boundaries of GHG information***: what types of GHG emissions need to be reported, what are the reporting boundaries?
- ***Calculation methods***: is a methodology prescribed to calculate or estimate GHG emissions?
- ***Verification or assurance***: does the scheme require verification of reported information?
- ***Reporting platform***: to whom is the information submitted or where is it published?
- ***Enforcement:*** does the scheme include enforcement mechanisms, such as penalties?[5]
- ***Use of information***: what is the purpose of the scheme and the intended use of reported?

Table 1. Building blocks of corporate climate change reporting schemes

COMPANY				GOVERNMENT	
SCOPE AND BOUNDARIES OF INFORMATION	CALCULATION METHODS	VERIFICATION OR ASSURANCE	REPORTING PLATFORM	ENFORCEMENT	INTENDED USE OF REPORTED INFORMATION
Content of information to report Scope of GHG emissions Boundaries Reporting entities	Measurement standards and methods Source of emission factors	Mandatory or voluntary Level of assurance Reference standards for verification	Publication of information Submission to a reporting platform	Monitoring and compliance mechanisms Follow-up with companies	Input into GHG emissions reduction program Pricing of GHG emissions (taxes or emission trading) Awareness building

Source: Kauffmann, Tébar Less et al (2012)

5 This includes enforcement by a range of authorities, e.g. securities regulators, environmental authorities, etc.

A complementary report by CDSB (2012) made the case for encouraging consistency of approach to these building blocks across different reporting schemes.

In 2015, the WRI and the World Bank Group issued the "Guide for Designing Mandatory Greenhouse Gas Reporting Programs". The report proposes specific steps for establishing GHG reporting programs as follows:

- Determine program objectives based on local context and priorities;
- Create an enabling environment by establishing the legal architecture; seeking stakeholder engagement; and building institutional human resource, technical and financial capacity;
- Determine program structure and requirements including program coverage, emissions quantification methodologies, reporting requirements, reporting platform, quality control and quality assurance procedures and enforcement rules;
- Conduct program review by focussing on program's process, its substantive details and/or its impact and determine who should conduct the review, and how it is to be conducted.

The OECD and CDSB reports highlighted the rapid development of corporate climate change reporting schemes and the benefits that can be derived from reporting. However, corporate climate change reporting remains a relatively young discipline. This report and the WRI/World Bank study show that there remains a lack of established standards and measurement methods for climate change reporting and that the steps suggested in that study are not consistently applied by governments developing reporting schemes.

Policy routes for climate change-related reporting requirements

Corporate climate change-related reporting requirements are introduced through various policy and legislative routes. Reporting requirements may be introduced through specific law on GHG reporting or embedded within wider environmental, climate change, sustainability, corporate social responsibility, governance or corporate law. For an increasing number of governments, corporate climate change reporting requirements and guidance are part and parcel of wider climate and sustainability policies and an integral element of market based mechanisms including GHG emissions trading schemes. The multi-disciplinary nature of climate change and the range of policy areas affected by its causes and effects means that measures to address climate change are introduced through multiple policy routes, examples of which are shown in Table 2 below.[6]

6 The table does not cover all of the policy routes available for the introduction of corporate climate change related reporting requirements. For example, the approach adopted by France through Grenelle II introduces a body of law aimed specifically at achieving sustainability and CSR objectives, and includes provisions requiring certain companies to report on the social and environmental consequences of their activities.

Table 1. Policy routes for corporate climate change related reporting requirements

TYPE OF POLICY OR LEGISLATION	EXAMPLES
Corporate law	In some jurisdictions requirements to report environmental performance (including GHG emissions and other climate change related information) are being incorporated into corporate law to complement existing requirements on disclosure of principal risks and material information necessary for assessing the performance of the company, or existing requirements are being interpreted as being capable of applying to climate change. Examples include the UK Companies Act to which GHG emissions reporting requirements have been added. The Canadian Continuous Disclosure Obligations (NI51-102) and US federal securities, laws and regulations have been the subject of authoritative guidance confirming that, to the extent material, existing requirements apply to climate change related matters.
Environmental laws	Environmental legislation providing for climate change related disclosure can include: • Legislation focused specifically on corporate disclosure of GHG emissions, such as Australia's NGER scheme, Canada's Greenhouse Gas Emissions Reporting Program and the US' Mandatory Greenhouse Gas Reporting Rule. • GHG emissions reporting requirements as part of legislation designed to control and track pollutants and to develop national pollutant release inventories, such as the Canadian National Pollutant Release Inventory. • GHG emissions reporting requirements as part of law designed to reduce energy consumption or improve energy efficiency, such as the UK's CRC Energy Efficiency Scheme. • More general environmental reporting requirements such as Japan's Law Concerning the Promotion of Business Activities with Environmental Considerations, 2005, which requires companies to publish an annual environmental report.
Corporate governance	In some jurisdictions, climate change reporting is part of corporate governance law or practice. For example, the Australian Stock Exchange Corporate Governance Council's Corporate Governance Principles and Recommendations states at Principle 7.4 that "a listed entity should disclose whether it has any material exposure to economic, environmental and social sustainability risks and, if it does, how it manages or intends to manage those risks." Environmental sustainability is defined in the glossary as "the ability of a listed entity to continue operating in a manner that does not compromise the health of the ecosystems in which it operates over the long term." Although not specifically stated in Principle 7.4, the cross reference in footnotes to the Climate Change Reporting Framework produced by the Climate Disclosure Standards Board (CDSB) implies that climate change related reporting forms part of the corporate governance requirement if considered material.

Stock exchanges	Stock exchanges around the world are introducing specific climate change and wider environmental or sustainability reporting requirements for their registrants. Requirements have been introduced by exchanges in Australia, Brazil, Canada, China, India, South Africa and many others. Information about stock exchange reporting requirements on climate change and other sustainability information may be found in CDSB's report Climate Resilient Stock Markets (2014) and via the Sustainable Stock Exchange Initiative. The 2014 Report on Progress prepared by the Sustainable Stock Exchanges (SSE) initiative, examined activity across 55 exchanges (UNCTAD et al, 2014). It found that over 40% of the 55 exchanges reviewed offering at least one index integrating social and/or environmental matters, over one third of the reviewed exchanges providing either sustainability reporting guidance or training to companies listed on their exchange and 12 requiring the reporting of social and environmental matters by at least some of their listed companies, with only 7 of which requiring reporting for all listed companies.
Sustainability and corporate social responsibility	In Europe, for example, the EU Non-Financial Reporting Directive requires companies within its scope to "include in the management report a non-financial statement containing information to the extent necessary for an understanding of the undertaking's development, performance, position and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters." Paragraph 7 of the preamble to the Directive clarifies that information about environmental matters includes "details of the current and foreseeable impacts of the undertaking's operations on the environment, and, as appropriate, on health and safety, the use of renewable and/or non-renewable energy, greenhouse gas emissions, water use and air pollution."
Market based mechanisms	Many countries have introduced carbon trading/cap and trade/pricing schemes as part of their approach to managing climate change. The World Bank's Annual Review of Carbon Markets shows that such schemes are present on almost all of the world's continents in some form. (World Bank Group, 2014, 2015). Market based schemes generally include requirements for participants to report their GHG emissions. An example is the EU Emissions Trading Scheme, which is implemented at a national level by EU member states. Currently according to the World Bank (World Bank Group, 2015), among the G20 countries, France, and the UK have both national-level ETS and carbon tax mechanisms in place. Germany has a national-scale ETS. China, the US and Canada have region/province/state-level market mechanisms of both ETS and Carbon Tax varieties. Additionally, China is considering scaling up to a national scheme. In Brazil and Turkey the implementation of an ETS is under consideration. Lastly, South Africa has a national carbon tax scheme in place but no ETS.

Benefits of disclosure

Table 3 summarises the most commonly cited benefits of climate disclosure. It looks at the various uses of reported information, as well as the benefits to the reporting company and key decision makers (investors, buyers vis-à-vis their suppliers, and governments).

Table 2. Uses and benefits of climate change related information

USER	USES	BENEFITS
Reporting companies	• Identify climate related risks and opportunities • Inform business and management strategy • Identify potential operational or managerial efficiencies • Measure progress and performance • Comply with legislation, listing requirements or internal sustainability policy • Respond to demand for more and better information • Serve as a marketing and communication tool	• Increased awareness and understanding of risks and opportunities • Maximise operational efficiency • Opportunities for cost savings • Develop more informed, resilient and sustainable long-term strategies • Enable more effective governance • Easier access to capital associated with confidence in performance • Improved performance in financial markets • Higher ranking on indices • More accurate and useful benchmark setting and progress measurement • Improve reputation through demonstrating leadership and transparency.
Buyers (purchasing companies)	• Factor into purchasing decisions • Demonstrate sustainable supply chains • Highlight supply chain inefficiencies and points of improvement; and Identify and monitor risks and opportunities throughout the supply chain	• Ability to make more sustainable, stable and resilient purchasing decisions • Improve reputation through demonstrating leadership and transparency • Better equipped to manage climate change risks and opportunities throughout the supply chain • Easier to comply with internal and external targets and policies on sustainability.

User	Uses	Benefits
Investors	• Use indices to optimize returns • Support company engagement • Conduct investment research • Inform broker recommendations; • Conduct sector and portfolio analysis • Inform exclusion and divestment criteria	• Access to corporate information identifying exposure to risk and opportunities • Ability to allocate capital towards its most productive uses • A better understanding of tangible and non-tangible assets and value • Contribute to due diligence obligations in assessing investment risks and in observing responsible business conduct standards.
Government/ policy makers	• Assess the current effectiveness of policies • Identify limitations or points for improvement in legislation • Set targets or goals and assess performance against them • Comply with or work towards international agreements, targets or expectations • Compile national GHG inventories • Encourage best practice • Sanction under-achievement • Stimulate progress in terms of competitiveness and sustainability.	• Formulate informed, clear and effective policies • Promote corporate sustainability • Demonstrate leadership and engagement in efforts to combat climate change.

Source: Adelphi, 2011; DECC, 2015; Carbon Trust, 2011; CDP, 2013; CDSB, 2012; KPMG, 2012; UNEP, 2013; Zeigler et al., 2011.

Use and impact of reported information

Climate change related information is reported to a wide range of audiences such as governments, investors, large purchasing organisations, advocacy groups and civil society. There are no formal mechanisms for determining the way in which climate change-related information is used or the impact it has and, thus, there are very few studies on the contribution that climate change information makes to particular objectives. This reflects the diversity of the audiences for which information is reported and the multiplicity of purposes for which it can be used. Some general uses for reported climate change information include consumer decisions, assessment of performance against policy objectives, investment analysis and risk analysis.

Where companies do not provide information, shareholders have engaged with companies through resolutions encouraging a company to begin, or improve its, reporting of climate change information. There have been some examples of this. In April 2015 an overwhelming majority (98%) of BP's shareholders voted to pass "Special Resolution 25" (prepared by the "Aiming for A" coalition of UK asset owners and mutual fund managers) which sets out progressive corporate policies with regards to climate change. Article 1 of the Shareholders supporting statement to Resolution 25 asks for more progress towards attaining an "A" performance band in the company's annual CDP response. In addition to this, the statement also requests more action on low-carbon research, development and investment strategies and the use of strategic Key Performance Indicators (KPI's) and executive incentives in the context of the transition to a low carbon economy as well as other, more general sustainability and corporate-social responsibility (CSR) requests.

The contribution that businesses make to climate change mitigation or adaptation is evidenced by the outcomes or actions that are reported by companies, often against the targets that companies themselves have set. In the absence of standards against which to assess the overall effect of reported information, it is difficult for preparers or users of information to determine whether, individually or collectively, the information reported by companies contributes to the achievement of wider climate change policy goals.

As an example of activity already underway to develop assessment standards, the Science Based Targets Initiative has been established to develop tools and research aimed at aligning business goals with climate science. "Mind the Science", an interactive report by CDP, makes the business case for setting science-based targets and analyses the current targets of 70 of the world's largest companies[7]. Together CDP, WRI, WWF and Ecofys have developed a Sectoral Decarbonization Approach designed to help companies in energy-intensive sectors use their science-based targets.

The next section looks at how investors and purchasing organisations are using climate change-related information, and the associated impacts of using this information.

Use by investors

There is some evidence of investor demand for high quality corporate climate change-related information and of the urgency with which investors are considering the impact of climate change related impacts on their portfolios.

A 2015 report by Mercer entitled "Investing in a Time of Climate Change" finds that investors cannot ignore the impact of climate change on investment returns. The study finds that investors can manage the risk most effectively by factoring climate change into their risk modelling. In order to do so, they need reliable information about the type and extent of existing and prospective climate risks and opportunities. Organisations such as the UN sponsored Principles for Responsible Investment (PRI), CERES and the Global Investor Coalition publish investor expectations of corporate climate information and ways in which they have responded. An online platform detailing investors' actions to combat climate change, the "Investor Platform for Climate Actions" and the Asset Owners Disclosure Project, a not for profit organisation, tracks what the world's largest investors are doing to manage climate change.

The report by Mercer (2015) further states that investors have two "key levers" for taking action – investment and engagement and that "from an investment perspective, resilience begins with an

7 CDP, http://sciencebasedtargets.org/

understanding that climate risk can have an impact at the level of asset classes, of industry sectors and of sub-sectors". The report goes on to say that engagement enables investment managers to ensure that companies in their portfolios are taking appropriate climate risk management measures and that undertaking associated reporting as "actionable information" to assess climate risks is essential to protecting investor interests.

There is mixed evidence about the way in which investors respond to and use climate change-related information. A report by CDP and Sustainable Insight Capital Management (2013) found that industry leadership on climate engagement was linked to higher performance on three financial metrics – return on equity, cash flow stability and dividend growth – but that no discernible value premium was awarded to such leaders. A report by KPMG (2012), in contrast, finds that a large carbon footprint has a negative impact on firm value.

While there is limited evidence of a direct correlation between climate change-related information and firm value, there is some non-quantifiable evidence of investors using information for a range of other purposes, including to:

- monitor emissions;
- engage with companies on emissions disclosure and/or management;
- (on the buy side) rank and compare companies, on climate change leadership, operations management, supply chain management, product development and innovation, and governance;
- reduce exposure to carbon-intense holdings;
- conduct investment research;
- invest in low-carbon solutions; and
- integrate climate-related analysis into mainstream investment decisions.

While investors and others have benefited from improvements in corporate climate change reporting, both in terms of the quantity and quality of information, some studies suggest that the information is not yet of sufficient quality and consistency to be actionable. For example a 2013 survey by Eurosif and the Association of Chartered Certified Accountants (ACCA) entitled "What do investors expect from non-financial reporting" concluded that while 89% of respondents felt that sustainability reporting was "essential or of high-importance", 78% said that current levels of disclosure are inadequate. The report also identifies concerns as to the consistency, clarity and comparability of sustainability reporting in general, but that would often also encompass climate change reporting:

- 93% of respondents agreed that European companies need to be more consistent and transparent in their non-financial reporting;
- 84% of respondents agreed established standardised reporting frameworks need to be used by companies to achieve both aims;

- 93% felt that current non-financial reporting is not sufficiently comparable and that non-financial information should be better integrated with financial information;

- While 69% of survey respondents agreed that current non-financial information published by companies is linked to the CSR policy;

- 74% felt it was not linked to business strategy and risk and 93% said that sufficient information was not provided to quantify the materiality of non-financial factors in financial terms; and

- Although qualitative policy statements were deemed important in assessing financial materiality by 77%, this was substantially less than the 97% of respondents who viewed quantitative key performance indicators as essential. There was also the opinion that companies affected by this proposed legislation would benefit from guidance on how to put these new measures into practice.

Use by purchasing organisations

Purchasing organisations, i.e., companies that procure from other companies and often manage complex supply chains, use information from their suppliers to identify risks related to the latters' operations, and to work with suppliers to manage those risks and increase efficiencies.

CDP and Accenture's 2014-2015 Supply Chain Report identifies the following impacts from purchasing organisations' use of information:

- Agreement of GHG emissions reductions targets for suppliers: the percentage of suppliers setting emissions targets – a crucial and advanced component of climate risk management – showed a steady upward trend. In 2014, 48% of suppliers in the CDP Program set targets, up from 44% in 2013 and 39% in 2012;

- Development of climate risk metrics: the share of suppliers implementing procedures to tackle climate change remained steady at 62%;

- Development of systems: one participant in the CDP Program has introduced a global data collection system throughout the supply chain to support its carbon management program;

- Strategic focus: participants in CDP's Program show evidence of devising and applying their group strategies on climate change to apply to the whole of the value chain.

- Risk management and efficiency focus: CDP's 2014-15 results show a small improvement in the percentage of suppliers reporting that their emission reduction initiatives are producing monetary savings, while those reporting carbon dioxide savings has held steady. Globally, 33% of suppliers report monetary savings, up from 32% in 2013 and 29% in 2012. Meanwhile, the figures for those reporting carbon savings stood at 40% in 2014, 40% in 2013 and 34% in 2012.

Depending on their particular sector, Scope 1 and Scope 2 GHG emissions represent a small proportion of organisations' overall carbon footprints compared with Scope 3 GHG emissions.[8]

8 info.firstcarbonsolutions.com

However, reporting Scope 3 emissions is still an area of complexity. Evidence from CDP's Supply Chain program further suggests that Government guidance and regulation does influence supply chain reporting, particularly in countries where strong, consistent governmental guidance and leadership regarding climate change measurement and reporting exist.

For example, in France approximately 66% of suppliers engage with their value chain partners, 16% above the global average of just 50%. 81% of those engaged supplier companies have procedures in place to assess climate risk, 77% of them disclose both scope 1 and 2 emissions and 64% set themselves emission reduction targets (CDP, 2015).

Similarly, in the UK, 60% of suppliers engage with their value chain and of these companies 74% have climate risk assessment procedures in place, 73% report both scope 1 and 2 emissions and 59% set themselves emission reduction targets. Conversely, in countries where there is less clarity and guidance from government, response levels to CDP from supplier companies – as well as the quality of those responses – are limited. For example only 41% of Chinese supplier companies engaged with their value chain and of these 55% reported having climate risk assessment procedures in place, 49% reported both scope 1 and 2 and 59% set themselves reduction target (CDP, 2015).

II. G20 COUNTRIES' CORPORATE CLIMATE CHANGE REPORTING SCHEMES

Selected climate change reporting schemes in G20 countries

This chapter explores various aspects of selected corporate climate change reporting schemes in G20 countries. Collectively, G20 economies account for approximately 85% of the GDP, around 80% of the world's trade, two thirds of the world population, and over 85% of global GHG emissions (Table 4).

Table 4. G20 countries' GDP and GHG emissions

	GDP in USD Billion	As % of World GDP	GHG Emissions as % of World Total
World	77,302	100	
G20	65,454	84.7	85.22
Argentina*	540.164	0.7	0.54
Australia	1,444.19	1.9	1.11
Brazil	2,353.03	3.0	1.25
Canada	1,788.72	2.3	1.48
China*	10,380.38	13.4	24.65
EU	18,469	23.9	11.04
France	2,846.89	3.7	1.07
Germany*	3,859.55	5.0	2.22
India	2,049.50	2.7	5.98
Indonesia	888.648	1.1	1.29
Italy	2,147.95	2.8	1.21
Japan	4,616.34	6.0	3.48
Mexico	1,282.73	1.7	1.32
Russia*	1,857.46	2.4	5.18
Saudi Arabia	752.459	1.0	1.38
South Africa	350.082	0.5	1.37
South Korea	1,416.95	1.8	1.69
Turkey*	806.108	1.0	0.89
United Kingdom	2,945.15	3.8	1.47
United States	17,418.93	22.5	16.60

*Sources: GDP data: OECD National Accounts database and IMF World Economic Outlook. * = GDP estimated for 2014. GDP based on current prices. GHG emissions data: G20 Watch, (http://g20watch.edu.au) based on World Bank data (http://data.worldbank.org).*

For the purposes of this analysis, one country scheme can be composed of several pieces of legislation (or sub-schemes). These may include the legislative provision(s) containing the reporting requirements and associated material designed to support the implementation of these requirements. Canada, the EU, Germany, Italy, South Korea and the US have packages including two sub-schemes, Japan has three sub-schemes. Some, as in the case of Japan and South Korea are "packaged" as instruments and measures introduced under a "framework" law and may therefore be considered as part of a single scheme. By contrast, in the case of Canada and the US, there are distinct bodies of environmental and corporate law in place to require corporate climate change reporting. The corporate laws have been interpreted in authoritative guidance (by the US SEC and the Canadian Securities Administrators respectively) to apply to climate change risks and are therefore included in the table. In this chapter, the report analyses *country trends* wherever possible to show the overall practices that

apply in the 15 G20 countries that have introduced schemes. However in some cases, the report analyses *scheme trends* where this produces more meaningful results. For example, an analysis of the thresholds that apply to identify companies or facilities within scope is most meaningful at scheme level.

In order to keep the analysis in this chapter manageable, only schemes with certain defined characteristics have been selected for review. In particular, the analysis in this chapter focuses on:

- ***Mandatory reporting schemes*** implemented, enabled or enacted by governments in the G20 countries. For the purposes of this analysis, a mandatory scheme imposes a legal obligation on the organisations within its scope to report the requested climate change information;

- Schemes that request ***all or some types of climate information***;

- Schemes that apply at ***national or regional*** (for example European Union) level in G20 countries. Schemes that apply at federal, state, province or city level (for example, state level schemes in Argentina and Canada, or Tokyo's city level scheme) are not taken into account for the purposes of this analysis;

- ***Existing and prospective schemes***, provided that the prospective scheme has been published in draft format;

- Schemes that apply to ***corporate entities operating in G20 countries*** and that are generally aimed at obtaining information from companies and influencing corporate behaviour in relation to climate change risks.

The inclusion, or not, of the following types of schemes in this analysis merit further explanation:

- ***Emissions Trading Schemes:*** Although many G20 countries have introduced emissions trading schemes (ETS) on a voluntary or mandatory basis and those schemes necessarily include requirements for participants to report climate change-related information, ETS' (with the exception of the EU scheme) are not included in the analysis because the reporting requirements are incidental to the market mechanism of the scheme, rather than aimed at corporate reporting of climate change information specifically.

- ***European Directives:*** As an exception to the criterion that only national schemes are covered, the analysis does take account of Directive 2003/87/EC and subsequent amendments establishing the ETS, which requires greenhouse gas emissions reporting by facilities/companies within scope. This is because the Directive lays the basis for climate change reporting in several G20 countries. As a result, there is some duplication between the Directive and national schemes (for example in Italy and Germany) that have transposed the directive into national law. Similar considerations apply to Directive 2014/95/EU on disclosure of non-financial and diversity information by certain large undertakings and groups – otherwise known as the EU non-financial reporting directive (EU NFR). The EU NFR was enacted in 2014 to amend the EU Modernisation Directive (2003/87/EC) (which itself superseded the European 4th and 7th Accounting Directives). The legislation mandates the reporting of "information to the extent necessary for an understanding of the undertaking's development, performance, position and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters." The preamble to the

Directive states that "where undertakings are required to prepare a non-financial statement, that statement should contain, as regards environmental matters, details of the current and foreseeable impacts of the undertaking's operations on the environment, and, as appropriate, on health and safety, the use of renewable and/or non-renewable energy, greenhouse gas emissions, water use and air pollution". It is therefore included in this analysis as a scheme that requests some of the information listed above.[9]

- ***General environmental reporting schemes***: Some national schemes (including Argentina, India and Indonesia) take the form of general provisions for environmental reporting that could be interpreted to apply to climate change information, but do not explicitly require the disclosure of the types of information listed above either in the legislation itself or associated guidance. The absence of specific requirements means that climate change information could legitimately be excluded from corporate reporting in those countries. The schemes concerned are therefore not included in this analysis of G20 climate change reporting schemes.

Two countries, Australia and France, have legislation in place that requires investors to report on their climate actions. The Australian Corporations Act 2001 (s1013DA) requires issuers of financial products to disclose in Product Disclosure Statements (PDSs) how labour standards or environmental, social or ethical considerations are taken into account in selecting, retaining or realising an investment. Currently French law requires institutional investors to report how their investment policies take account of social and environmental factors. The French Energy Transition Bill is a wide ranging prospective body of law that will add new reporting requirements for institutional investors. The amendments of Article 48 of the Energy Transition Law in France, passed through Parliament but still subject to Senate approval, require listed companies to disclose, in the annual report subject to the vote of the shareholders: financial risks related to the effects of climate change; measures adopted by the company to reduce those risks, by implementing a low-carbon strategy in every component of their activities. The annual report has to include, in addition to the reporting on social and environmental consequences of the company's activity (already in the law) the consequences on climate change of the company's activities, including the use of goods and services produced.[10]

As these pieces of legislation do not specifically target companies' climate change information they have not included in this analysis.

Various sources of information have been used for the purposes of this analysis. The original text of legislation has not been available for review in English in all cases and information about schemes or their features is sometimes conflicting, inconclusive or absent (for example, on the type of verification that is required). The analysis below is based on the best available information. It is intended to show general trends in corporate climate change schemes (as defined above) in G20 countries rather than to provide a detailed analysis of each scheme. Table 5 provides an overview of schemes included for the purposes of this analysis.

9 The EU NFR must be transcribed into national law by EU member states by 2018, but some European G20 countries have already introduced national schemes that contain some or all of the requirements of the Directive. In France and the UK, schemes contain provisions that go beyond the current climate change-related requirements of the European Directives and those specific schemes are therefore reflected in the table below, but the analysis does not take account of the way in which the European Directives have been transposed into UK and French national law.

10 .2° Investing Initiative, http://2degrees-investing.org.

Table 5. Overview of G20 countries' mandatory climate change reporting schemes

Country	Scheme name	Description
Argentina		
Australia	National Greenhouse and Energy Reporting (NGER) scheme	The, scheme is overseen by the Department of the Environment and administered by the Clean Energy Regulator. The scheme aims to inform government policy and the public, to help Australia meet its international reporting obligations and to provide a single national scheme for energy and GHG emissions reporting. The scheme covers around 60% of Australia's GHG emissions.
Brazil	Despacho 3034/2006	The scheme was implemented by the Agencia Nacional de Energia Eletrica (ANEEL) to promote GHG reporting practices amongst public electricity providers and other companies.
Canada	Greenhouse Gas Emissions Reporting Program 2004 (GHGRP) introduced pursuant to section 46 of the Canadian Environment Protection Act 1999	Environment Canada operates the scheme and is responsible for its development. Entities that do not meet the threshold requirements are encouraged to report voluntarily. The program is expected to apply to over 500 facilities, in all sectors, across Canada.
	National Instrument 51-102	The continuous disclosure obligations in NI 51-102 have been interpreted in Canadian Securities Administrators Notice 51-333 to apply to disclosure of environmental information.
China	National Development and Reform Commission (NDRC) Regulation 2014	The aim of this scheme is to increase transparency among major air pollutant emitters and strengthen the national infrastructure for measurement, reporting and verification of carbon emissions by mandating reporting of GHG emissions across 10 specific industry sectors. The scheme applies to 20,000 companies.
EU	Directive 2014/95/EU on disclosure of non-financial and diversity information by certain large undertakings and groups	The scheme amends Directive 2013/34/EU (the Modernisation Directive) in order to "increase the relevance, consistency and comparability of information disclosed by certain large undertakings and groups across the Union". This Directive amends the. Directive 2013/34/EU. The amendment came into force in December 2014, and EU members have two years to incorporate it into domestic law. The first corporate reports under the scheme will be produced in 2017.
	Directive 2003/87/EC establishing the EU Greenhouse Gas Emissions Trading Scheme and subsequent revisions	The scheme covers companies in energy-intensive sectors, i.e., energy production, production of ferrous metals, cement and lime, ceramics, bricks, glass, pulp and paper. The EU ETS covers more than 11,000 power stations and manufacturing plants in the 28 EU member states as well as Iceland, Liechtenstein and Norway. Aviation operators flying within and between most of these countries are also covered. In total, around 45% of total EU emissions are covered by the EU ETS (EU, 2013).
France	Grenelle II Act, 2010, and subsequent revisions and Bilan d'Emission GES	The Grenelle II legislation in France was developed and implemented by the Ministry for Ecology, Sustainable Development and Energy. Grenelle II mandates disclosure of the carbon footprint of companies within scope of the scheme. It is supported by Bilan d'Emission de GES, the associated greenhouse gas emissions reporting methodology.
Germany	Reform Act on Accounting Regulations 2004 (BilIReG) – to be amended by Directive 2014/95/EU	A scheme introduced to implement European Accounting Directives, now updated by the Modernisation and NFR Directives.

Country	Scheme name	Description
	Greenhouse Gas Emission Allowance Trading Act	A scheme introduced to implement the EU ETS.
India		
Indonesia		
Italy	Legislative Decree No. 32 2007	A scheme introduced to implement European Accounting Directives now updated by the Modernisation and NFR Directives.
	Legislative Decree No 216 2006	A scheme introduced to implement the EU ETS.
Japan	Act on Promotion of Global Warming Countermeasures (Act No. 117 of 1998)	A scheme administered by the Ministries of Environment and Economy Trade and Industry that forms a framework for a package of measures on climate change. GHG emission reporting is part of a broader package of regulation and incentives to restrain and reduce GHG emission. In addition to the 2006 reporting scheme, a range of governmental schemes are in place to support energy and climate change policies including the Japan's Voluntary Emissions Trading Scheme, and the Experimental Emissions Trading Scheme.
	Law Concerning the Promotion of Business Activities With Environmental Consideration 2005	A scheme whose purpose is to clarify the responsibilities of the State in providing and making use of information on the state of business-related environmental consideration and to takes measures to prepare and publish environmental reports by specified corporations so as to ensure appropriate business-related environmental conservation.
	JP-8 Mandatory Greenhouse Gas Accounting and Reporting System 2006	A scheme developed and implemented by the Ministry of Environment and Ministry of Economy, Trade and Industry that imposes GHG reporting requirements on entities and facilities designated under the Act on Promotion of Global Warming Countermeasures
Mexico	Regulation of the General Climate Change Law in Respect of National Register of GHG emissions or Regulation 2014	Compliance with the scheme is necessary to obtain an annual operating license for companies within scope. The Ministry for Environment and Natural Resources (Secretaría del Medio Ambiente y Recursos Naturales, SEMARNAT) is responsible for its development and implementation.
Russia		
Saudi Arabia		
South Africa	Draft National Greenhouse Gas Emission Reporting Regulations pursuant to the National Environmental Management Air Quality Act 39 of 2004	The draft scheme was published in Government Gazette No. 38857 for public comment in June 2015.

Country	Scheme name	Description
South Korea	The Framework Law on Low-Carbon Green Growth 2010	The scheme provides a framework for a package of measures aimed at addressing climate change.
	Greenhouse Gas and Energy Target Management Scheme 2012	A scheme established by the Greenhouse Gas Inventory and Research Center that requires the submission of climate change mitigation strategies by organisations within scope of the scheme as well as submission of an emissions report.
Turkey	Regulation Concerning Monitoring of Greenhouse Gas Emissions ratified by the Turkish Parliament in 2009 by Law No. 5836 and effective from 25 April 2012	A scheme implemented by the Ministry of Environment and Urbanisation in Turkey. Organisations within scope of the scheme must disclose a GHG Monitoring Plan and their GHG emissions. In its first year of implementation, the regulation covered around 600 facilities.
UK	Companies Act (Strategic Report and Directors' Report) 2013 Regulations	As part of a package of measures, the amendments require disclosure of greenhouse gas emissions in the directors' report or strategic report. There are 1,000 UK quoted companies potentially within scope of this requirement. Associated guidance issued by Defra supports compliance with the legal requirements and provides guidance on voluntary reporting by those outside the scope of the law. This Rule is part of the regulatory package under the 2008 Climate Change Act.
US	EPA Mandatory Reporting of Greenhouse Gases Rule 2009 introduced under the Clean Air Act 1970	The scheme is operated by the Environmental Protection Agency (EPA). This piece of legislation is reported to capture some 85% of US emissions.
	US federal securities laws and regulations	In February 2010, the Securities and Exchange Commission (SEC) issued "Guidance Regarding Disclosure Related to Climate Change" advising that climate change disclosure, to the extent material, is required under existing disclosure requirements.

Note: All schemes are based on one or more Laws (or, in the case of South Africa, draft Law). In Japan and South Korea, the scheme is a "package", including measures introduced by the government, which may include the legislative provision(s) containing the reporting requirements and associated material designed to support the implementation of requirements).

Building blocks of G20 country schemes

A total of 15 G20 countries currently have one or more mandatory corporate climate change-related reporting schemes in place or in preparation. The exceptions are Argentina, India, Indonesia, Russia[11] and Saudi Arabia, which either have a general scheme that might not necessarily be interpreted to apply to climate change information or have no scheme in place or in published draft format at the moment. As explained above, those schemes are therefore excluded from this analysis.

The schemes vary significantly, as shown in Table 6 and explained in more detail in the remainder of this chapter.

11 The Ministry of Economy of Russia is developing a system for GHG reporting expected to be operational by mid-2016 as is currently still undergoing methodological and legal clarifications. In addition, the National Climate Action Plan (2011-2023) from the Ministry of Environment and Urbanisation does set targets for specific sectors e.g. energy, transport, industry, waste, agriculture and forestry etc.

Table 6. Climate change reporting schemes in G20 countries: key features

15	G20 countries have a mandatory corporate climate change reporting scheme
15	schemes require reporting of direct GHG emissions (scope 1)
6	schemes require reporting of emissions related to consumption of purchased energy (scope 2)
0	schemes require reporting of indirect emissions (scope 3)
4	schemes encourage reporting of indirect emissions
9	schemes encourage reporting of information other than GHG emissions (e.g. risks, strategy)
15	schemes apply to companies within national boundaries
2	schemes also apply beyond national boundaries
12	schemes require verification of information
12	schemes provide penalties for non-compliance
14	schemes specify methods of GHG emissions calculation
12	schemes provide reporting guidance

Scope of information to be reported

GHG emissions: The 15 G20 countries with reporting schemes require reporting of direct emissions produced by the company (also known as Scope 1 GHG emissions following the language of the GHG Protocol. Roughly one third of those (6 in total) also require reporting of indirect (or Scope 2) GHG emissions linked to energy consumption. None of the schemes require mandatory disclosure of indirect (Scope 3) emissions.[12] The schemes in the US, France, Japan, Australia, UK and Brazil, either make reference to product or supply chain environmental impacts or encourage reporting on these on a voluntary basis. The preamble to the EU Non-Financial Reporting Directive indicates that supply chain due diligence should be undertaken which might in turn lead companies to consider reporting Scope 3 GHG emissions.

12 The GHG Protocol defines direct and indirect emissions as follows: (i) Direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity. (ii) Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity. The GHG Protocol further categorizes these direct and indirect emissions into three broad scopes: **Scope 1:** All direct GHG emissions; **Scope 2:** Indirect GHG emissions from consumption of purchased electricity, heat or steam; **Scope 3:** Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc. www.ghgprotocol.org

Table 7. Types of GHG emissions covered by G20 countries' schemes

TYPES OF GHG EMISSIONS		
Scope 1 Direct GHG emissions	**Scope 2** Indirect GHG emissions	**Scope 3** Other indirect emissions
Covered by: Australia Brazil Canada China European Union France Germany Italy Japan Mexico South Africa South Korea Turkey United Kingdom United States	**Covered by:** Australia France Japan Mexico South Korea United Kingdom	**Not covered but encouraged by:** European Union France Japan United Kingdom

Geographical scope: Practically all schemes in G20 countries apply to facilities and/or corporations that operate in or are registered in the country concerned. The UK scheme extends the requirements to companies registered or operating outside their jurisdiction, in particular, to subsidiaries of UK quoted companies, whether or not in the UK. The same is the case with the South African scheme.

Types of climate change information other than GHG emissions: Reporting of other types of climate change related information, such as exposure to climate risks, strategies to reduce emissions (including emission targets) and to address risks is required in a limited number of countries. Examples include:

- Canada, where Staff Notice 51-333 states that environmental risks, trends, uncertainties and liabilities should be reported where appropriate in response to continuous disclosure obligations;
- South Korea, where schemes requires companies to submit a climate change mitigation strategy and to report their policies, targets and performance on GHG emissions management;
- The US, where SEC interpretive guidance states that depending on their particular facts and circumstances, a company within scope of the Commission's rules and regulations might need to disclose under existing requirements, among other matters the expected impact of existing or pending climate legislation, physical impacts of climate change and material risks associated with climate change.

Verification and enforcement mechanisms

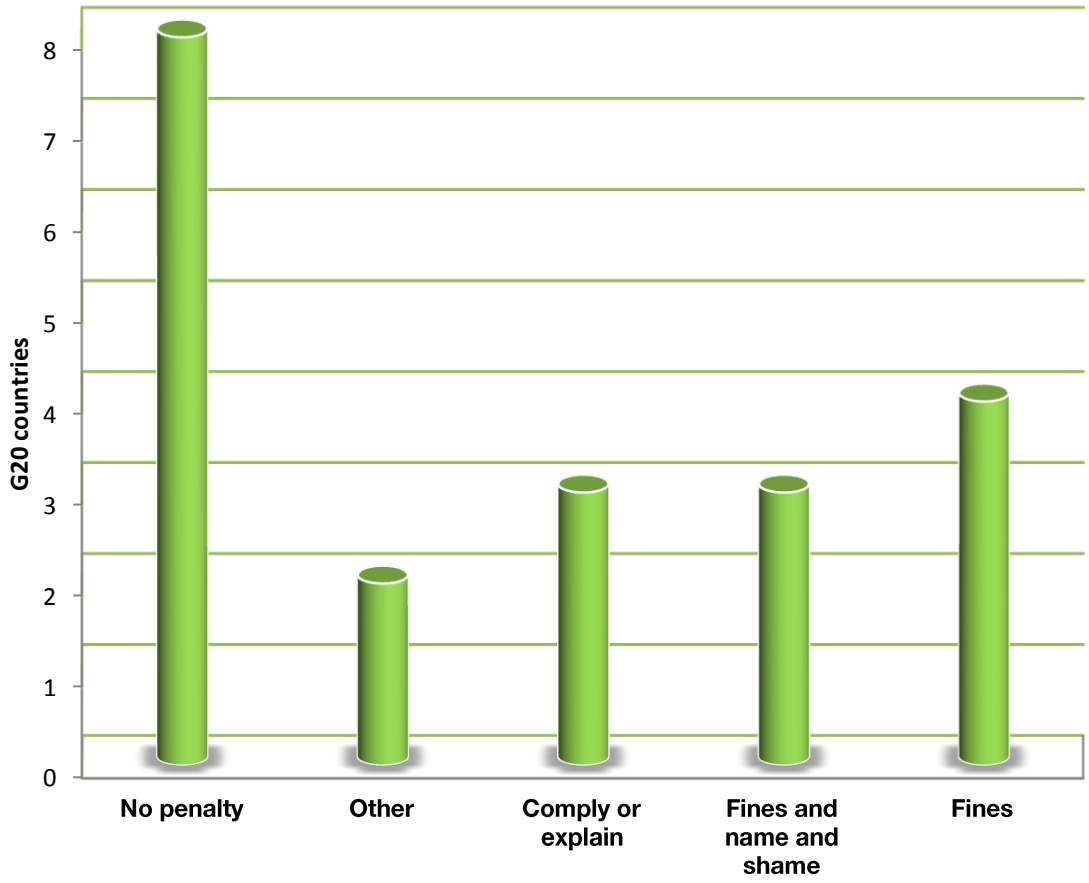
Verification: Some form of verification is required in the schemes of 12 G20 countries. The kind of verification stipulated varies from scheme to scheme or is not specified. Of the 12 schemes, 2 require independent, third party verification and, 7 mandate that the verification provider should hold some form of accreditation as well. In addition, 3 schemes include verification supplied by the implementing organisation of the reporting scheme (Australian NGER, Canadian Greenhouse Gas Emissions Reporting Program and US Mandatory Reporting of Greenhouse Gases Rule).

***Enforcement mechanisms*:** Some form of penalty for non-conformance is included in 12 schemes. Examples include the NGER scheme in Australia, the GHGRP in Canada, Directive 2014/95/EU in the EU and the Framework Law on Low-Carbon Green Growth in South Korea. Penalties are most often monetary fines; however, the EU ETS also stipulates that "member states shall ensure publication of the names of operators and aircraft operators in breach of requirements enough to have to surrender allowances". In Australia, while the program administrator provides help and education for minor violations, it also has the mandate to initiate investigations and pursue civil action for more serious violations. For cases that involve consistent violations or dishonest behaviour, the program administrator may issue infringement notices or pursue court action. In this case both courses of action are made public. Additionally, the law provides for potential fines of up to AUD 360,000 for failure to register for the scheme and applies daily fines of up to AUD 18,000 for each day of non-compliance. The penalty arrangements for each country – in so far as they apply to schemes that specifically request GHG emissions - are summarised in the table below The French Grenelle Law, Italian Legislative Decree No.32, EU Directive 2014/95/EU and the UK Companies Act requirements on GHG emissions reporting, apply on a "comply or explain" basis. In these instances, companies that do not comply with the legislation – and do not satisfactorily explain why – may be subject to legal action by shareholders and other groups.

Table 8. Types of verification requirements and penalties

Country	Verification	Penalties
Australia	Yes	Fines
Brazil	No	None
Canada	Yes	Unspecified
China	No	None
EU	Yes (independent/ accredited)	Fines + name and shame
France	Yes (independent/ accredited)	Comply or explain
Germany	Yes (independent/ accredited	Fines + name and shame
Italy	Yes (independent/ accredited)	Fines + name and shame
Japan	Yes (independent)	Fines
Mexico	Yes (independent/ accredited)	None
South Africa	Yes (independent)	Fines
South Korea	Yes (independent accredited)	Fines
Turkey	Yes (independent accredited)	Unspecified
UK	No	Comply or explain
US	No	Fines

Figure 1. Enforcement mechanisms in G20 country reporting schemes



Thresholds

The thresholds and criteria that determine which facilities and/or entities are within scope of schemes vary and may include criteria such as the extent of GHG emissions, the number of employees, the industrial sector, and the type of reporting entity. There are three broad categories of criteria that determine which companies or facilities are within the scope of the scheme as follows:

- Criteria relating to ***outputs*** (e.g.: of GHG emissions), ***consumption*** (e.g.: of energy) or ***activity*** (e.g.: fuel combustion or waste disposal). The table below denotes this category as "O/C/A". The Australia National Greenhouse and Energy Reporting Scheme is an example of an "O/C/A" threshold scheme as it uses output and/or consumption thresholds to determine applicability. In particular, facilities must report if their annual emissions (scope 1 and 2) ≥ 25,000 metric tons of CO2e (tCO2e) or if the total amount of energy produced or consumed ≥ 100 terajoules and corporate groups must report on all their facilities if group annual emissions (scope 1 + scope 2) ≥ 50,000 tCO2e or if the group total amount of energy produced or consumed ≥ 200 terajoules.

- By reference to particular ***sectors*** e.g.: transport or mining. The table below refers to this category as "S". An example is the EU ETS which applies to companies in certain sectors but there is some overlap with OCA criteria too.

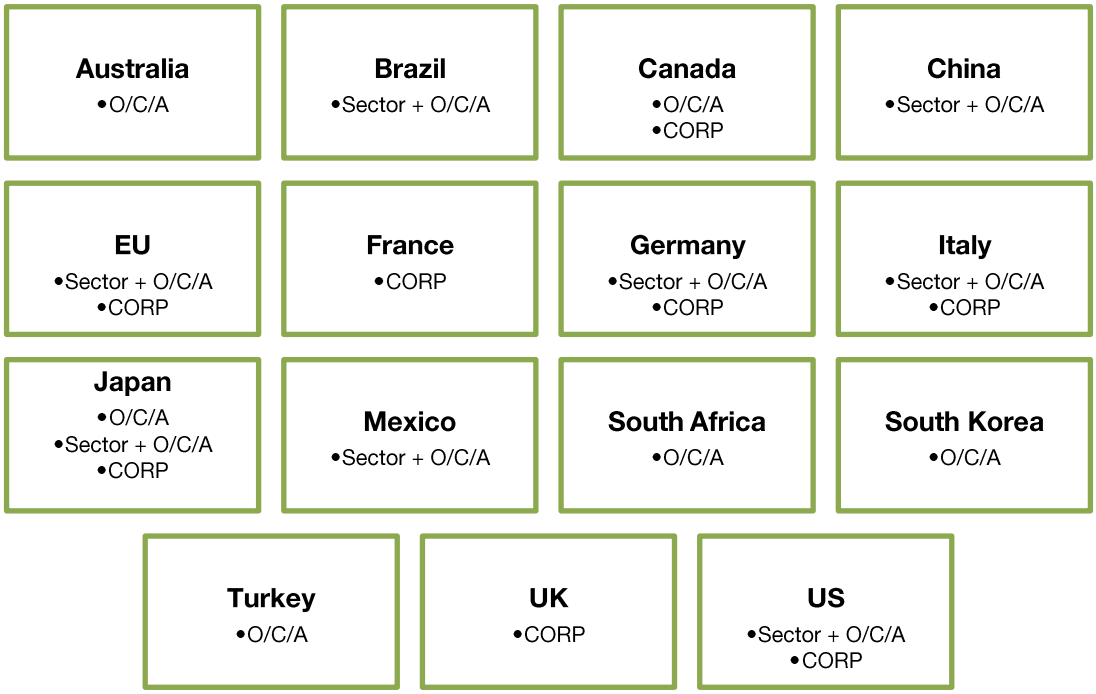
- By reference to the characteristics of a ***corporation*****,** such as its status or the number of its employees. The table below denotes this category of criteria as "CORP". The French Grenelle Law for example uses the characteristics of the corporation to identify entities within scope. In particular companies with 500 employees or more are within scope of the French scheme. The UK scheme also sets thresholds by reference to the corporate characteristics. It applies to "quoted companies" as defined by the Companies Act.

Table 9. Threshold categories in G20 countries' schemes

O/C/A - Output or consumption or activity threshold (e.g.: scheme applies to facilities or companies emitting GHGs or consuming energy above certain limits);

Sector - Scheme applies to certain sectors;

CORP - Applicability depends on type and characteristics of corporation including number of employees; whether within scope of national securities law etc.



Calculation methods and reporting guidance

Calculation methods: Calculation methods set out the approach that companies should take to preparing their GHG emissions figures. Depending on the level of detail in the scheme or associated guidance, calculation methods might specify how the company should capture and manage activity data and the emissions factors that should be used to convert GHG emissions to CO2 equivalents. The reporting schemes in 14 G20 countries include specific guidance on which GHG emission calculation methods should be used by reporting companies. A variety of calculation methods (many of which are produced by private sector organisations) are mentioned in the different schemes, for example the GHG Protocol, and ISO 14064-1. In some cases the scheme specifies how GHG emissions are to be calculated – for example in the US (Mandatory Reporting of GHG Rules) and Australia (NGER).

Reporting guidance: Several countries have developed guidelines to facilitate reporting, which form part of the overall climate reporting scheme. In the UK, Defra published Environmental Reporting Guidelines Including Mandatory GHG Reporting Guidance in 2013 in order to help companies comply with the Companies Act 2006 requirements to report GHG emissions and environmental information. The French Agency for Environment and Energy conservation (ADEME) introduced the ADEME Carbon Footprint Methodology and Bilan Carbone, a GHG emissions assessment tool to help companies account for GHG emissions. The Ministries of the Environment of Japan and South Korea introduced Environmental Reporting Guidelines to provide guidance on calculation methods for reporting

environmental performance indicators, on evaluating environmental performance and environmental accounting. 12 G20 schemes provide reporting guidance, and 14 specify which GHG calculation methodology to use.

CDP – a voluntary reporting scheme used in all G20 countries

In parallel with reporting to mandatory schemes, many companies worldwide, including in G20 countries, report climate change information to CDP. CDP is an international not-for-profit organisation that operates a global reporting mechanism for corporate disclosure of climate change and other environmental information.

Established in the year 2000, CDP uses the power of measurement and information disclosure to improve the management of environmental risk. Companies in all G20 countries already participate in CDP's annual reporting process. By leveraging market forces including shareholders, customers and governments, CDP has incentivised thousands of companies across the world's largest economies to measure and disclose their environmental information.

CDP manages a number of programs that collect information from companies and cities about their environmental impacts. For the purposes of this report, the ***Climate Change program*** is the most relevant. It is backed by 822 institutional investors representing in excess of USD 95 trillion in assets. Investors therefore provide the authority for the information requests to be made as well as the motivation for their investee corporations to respond to the requests. Under the climate change program, CDP sends an annual information request to the world's largest companies by market capitalisation and to certain other selected companies.

CDP uses a standard, established, global annual approach for the collection and dissemination of climate change related information. CDP's "Climate Change Information Request" provides the structure for corporate reporting. The request encompasses a wide range of information including risks, opportunities, governance, strategy, policies and performance. Companies receive and complete their CDP Information Request via CDP's online response system (ORS). CDP provides companies with detailed guidance on climate reporting. Information requested annually by CDP includes:

- Governance (e.g. governance responsibility, management incentives)
- Strategy (e.g. risk management approach, business strategy, engagement with policy makers)
- Targets, policies, initiatives and performance
- Risks and opportunities
- Methodology (e.g. base year, calculation methodology, boundary)
- Scope 1 , 2 and 3 emissions (including breakdown for all categories)
- Emission intensity
- Verification

Figure 1. Company responses to CDP climate change program in 2015

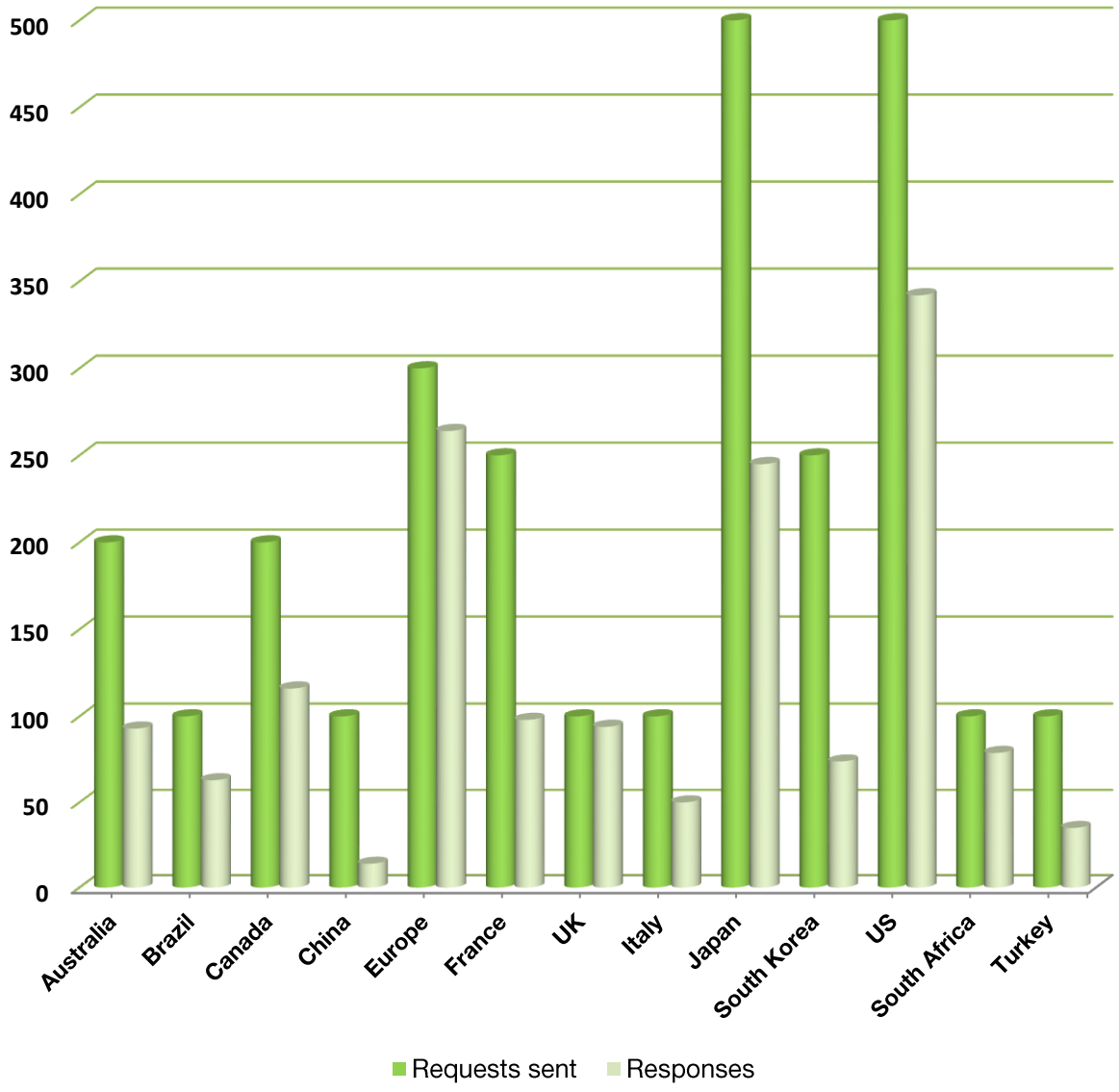


Figure 2 shows the number of requests sent, and responses received from companies in G20 countries in 2015.[13] Responses to the information request are submitted by companies to CDP's reporting platform. This is a public resource that gives investors access to a source of year-on-year information about climate change risks, strategies, performance, GHG emissions and more from companies around the world. The information supports long-term objective analysis by investors and other financial actors.

In addition to the climate change program, CDP's ***Supply chain programme*** is operated on behalf of large multinational companies whose procurement spending helps drive the global economy. The programme recognises that large companies at the top of supply chains are vulnerable to risks from uneven responses by their suppliers to physical and regulatory risks from climate change and environmental degradation. In 2014/2015 CDP's supply chain program was operated on behalf of 66 companies with USD 1.3 trillion in procurement spend. Through CDP, those companies ask their suppliers to disclose information on how they are addressing environmental risks and opportunities. Procuring companies provide the authority for information to be requested as well as the motivation for their suppliers to respond.

Overall, most mandatory reporting schemes in G20 require only a fraction of companies' climate change related information, focussing mainly on reporting (direct) GHG emissions. By contrast, CDP, a non-governmental reporting scheme, requests the full range of climate change information from companies and makes the reported information public for use by decision-makers. This suggests that there is some divergence between the range of information companies are willing and able to report under voluntary schemes, and the limited information requested by most governmental schemes, suggesting that policy makers have an opportunity to harness the reporting capacity and experience that has been built over the years.

13 The numbers are indicative only, as in some countries CDP approaches more than one sample of companies for information. In the UK for example, FTSE 250 and 350 (and others) are also approached. Where individual G20 countries are not listed above, companies in those jurisdictions are included in wider samples used by CDP, for example the Latin America sample. At international level, companies in the Global 500 and the 2 434 companies in the MSCI are also approached. 81% of Global 500 companies and 57% of MSCI companies responded to CDP.

III. CHALLENGES RELATING TO CLIMATE CHANGE DISCLOSURE

Corporate climate change disclosure is a relatively young discipline facing multiple challenges associated with the fragmentation and diversity of reporting requirements, including the disparity of routes through which information can be reported; technical challenges, including the complexity of reporting through the value chain; costs, etc. all of which may limit the effective use of corporate climate change information in decision-making. The main challenges associated with climate change disclosure include:

Fragmentation and complexity of reporting requirements

Climate change related reporting is maturing and developing fast. However, the rapid pace of development and the number of emerging mandatory and voluntary reporting requirements has led to fragmentation of approaches to climate change-related reporting requirements and a disconnect between those requirements and existing financial and governance reporting requirements. Despite the existence of guidelines and reporting frameworks, the lack of consistency and coherence between reporting requirements can be seen as complex, costly, confusing and burdensome for corporate preparers of information (Kauffman, Tébar Less et al, 2012; CDSB, 2012). It can also result in lack of inter-sectoral comparability in terms of emissions sources and factors. The challenges experienced by reporting organisations can also affect users of information. The lack of standardisation means that reported information varies in terms of quality, quantity and relevance. Limited, fragmented, non-assured or non-verified, inconsistent information could be difficult for readers to use in decision-making and the evidence of its use is inconclusive.[14]

Fragmentation also affects the channels through which information is reported. Corporate climate change related information is currently reported through multiple routes including, to a central governmental body (e.g. the EPA electronic reporting mechanism in the US, or the Environment Canada online reporting framework in Canada); on company websites; to a dedicated reporting platform such as Canada's "Single Window" system, the US' Edgar system and CDP's reporting platform; by publication in a sustainability report; in annual financial reports through inclusion of specific sections on environmental information (as the UK Companies act amendment of (year) requires).

The variety of places in which information may be found can make it difficult for users to locate the information, can create confusion for stakeholders and impede their access to the information. Financial reporting initiatives ask companies to report on their strategy, management, governance, risks and opportunities, performance and prospects; all of which are addressed in mainstream reporting. By treating GHG emissions and climate change related risk and opportunities in a similar manner and providing them in mainstream reports, organisations can apply the same management responsibility as statements and disclosures presented in financial reporting. One means of not only streamlining stakeholder access to the necessary information they require, but also enabling the financial-non-financial relationship, is by incorporating pertinent climate change information into mainstream corporate reports (integrated reporting).

14 Although not focussed specifically on corporate climate change, the World Business Council for Sustainable Development's annual "Reporting Matters" exercise illustrates the diversity of trends and approaches in the corporate reports of 162 of the world's leading companies (WBCSD, 2014).

A range of initiatives striving for more streamlined reporting are currently in place. The Climate Disclosure Standards Board (CDSB), for example, is an international consortium of business and environmental NGOs committed to advancing and aligning the global mainstream corporate reporting model to equate natural capital with financial capital. CDSB has modelled development of its Framework for Reporting on Environmental Information and Natural Capital on some of the approaches used for the development of international financial reporting and management control standards. CDSB has carried out mapping work to show that the requirements and principles reflected in its Framework represent the highest common denominator of a range of international practice on environmental reporting and in doing so, seeks to encourage coalescence and standardisation around those shared practices.[15]

The Corporate Sustainability Reporting Coalition has called upon UN member states to commit to developing a convention on corporate sustainability reporting (Aviva, 2012). The call to action was prompted in part by the Sustainable Stock Exchange Initiative, which indicated that stock exchanges would welcome a global approach to consistent sustainability reporting. A similar suggestion was made by CDSB in its submission to the UNEP Inquiry on Aligning the Financial System with Sustainable Development.[16]

The development of SASB sustainability accounting standards[17], designed for the voluntary disclosure of material sustainability information may now encourage greater consistency and comparability in reporting climate change related information, with SASB identifying the sustainability issues that are likely to constitute material information for most companies in an industry and outlining metrics to disclose quantitative impacts or risks.

In their April 2015 Communique, G20 Financial Ministers and Central Bank Governors called on the Financial Stability Board (FSB) to convene public- and private- sector participants to review how the financial sector can take account of climate-related issues. In response to this request the FSB hosted a high level public-private sector meeting to consider the implications of climate-related issues for the financial sector, focused on any financial stability issues that might emerge. The meeting discussed possible financial stability risks and mitigants, such as encouraging disclosure and exploring stress testing. On 9 November 2015, the FSB published a proposal to the G20 for the creation of an industry-led disclosure task force on climate-related risks.[18] At their 2015 Summit in Antalya, G20 Leaders asked the FSB to continue to engage with public and private sector participants on how the financial sector can take account of climate change risks.[19]

Technical challenges

Online databases such as corporateregister.com, the GRI's Sustainability Disclosure Database, and CDP's online reporting platform reveal that approximately 6 000 sustainability reports were published in 2011, with year on year growth of 17-20% from 2007 -2011 (UNEP, 2013). An estimated 95% of the

15 www.cdsb.net

16 UNEP, http://web.unep.org/inquiry.

17 The Sustainable Accounting Standards Board (SASB) was incorporated in 2011 for the purpose of establishing inquiry-based sustainability standards for the recognition and disclosure of material environmental, social and governance impacts by companies traded on U.S. exchanges. The SASB Sustainable Accounting Standards provide sector specific guidance material for use and adoption by companies required to, or choosing to, disclose their material CSR information. www.sasb.org

18 www.financialstabilityboard.org

19 G20 Leaders' Communiqué Antalya Summit, 15-16 November 2015, www.consilium.europa.eu/

world's largest companies now report on their sustainability (including climate change) performance. The response by companies to organisations like CDP and GRI demonstrates that companies (particularly large companies) are willing and able to report a wide range of climate change information and that they are starting to embed this into their annual reporting practices.

Despite, or because of, the burgeoning number of government schemes that require or encourage climate change related information, research suggests that businesses are facing challenges in responding. A study undertaken by Ceres (2014) investigated the state of S&P 500 reporting on climate change and comment letters from the US Securities and Exchange Commission (SEC) to companies between 2010 and the end of 2013. Ceres found that although the SEC was the first securities regulator to provide guidance on its expectations regarding climate change reporting, most S&P 500 10-K filings contain very brief information on climate change, provide little discussion of material issues and do not quantify impacts or risks. Ceres found that 41% of S&P 500 companies do not include any climate related disclosure at all in their 10-K filings in 2013. While not all companies may be required to include climate change related disclosure because it is not material to the company, Ceres notes that, among companies dependent on a predictable climate for agriculture, such as those in the apparel, food and agricultural industries, as well as transportation, telecommunications, manufacturing and other commercial activities that can be severely disrupted by extreme weather conditions, less than 50% of all companies in these industries address climate change in their 10-K filings. It also notes that barely half of all insurance companies addressed climate change.

The challenges companies face in reporting climate change related information are generally the same as challenges that affect other areas of corporate reporting, and include (CDSB, 2012):

- Determining the organisational boundary of the reporting organisation, for example whether and to what extent information should be reported about the activities of a parent company, its subsidiaries, joint operations and ventures, associates suppliers and upstream and downstream activities;

- Developing techniques for measuring the inputs and outputs relevant to climate reporting, methods of measuring activity (whether by estimation or direct measurement), how uncertainty should be measured and what units should be used for measurement of non-financial results;

- Determining which performance indicators best express climate change performance results;

- Identifying material information for climate change-related reporting purposes;

- Defining approaches to verifying and assuring climate change related information.

Other challenges

Costs: The costs of reporting include various components: employee time (e.g. understanding the rules, developing a compliance strategy, undertaking measurement/analysis and compiling the report, training, etc.); publication costs; contractor time (e.g. maintenance of measurement equipment); costs related to in-house or third-party verification; and development and maintenance of measurement and reporting software ((EU, 2009, Byers B. & Bessems J. 2015).[20]

Assessment and evaluation of information: Preparers and users of information are generally able to track a company's climate performance relative to its own results in previous reporting periods or relative to goals and targets set by management. The contribution that reporting makes to climate change mitigation or adaptation generally is evidenced by the outcomes or actions that are reported. However, except in cases where local targets for specific action apply, it is difficult for preparers or users of information to determine whether, collectively, the information reported by companies contributes to the achievement of wider climate change policy goals.

20 There are few studies on of the costs and benefits of corporate climate change related reporting. Defra's 2011 impact assessment (conducted prior to the UK adopting mandatory reporting requirements into the Companies Act 2006 in 2013) attempted to quantify the costs and calculated the overall cost to business over a 10 year period to be as much as GBP 6,025 million. The monetised benefits on the other hand were calculated to be only GPB 1,355 million. An independent analysis of the 2011 Defra impact assessment undertaken by Adelphi (2011), generally corroborates these key sources of cost to companies, but concluded that the Defra assessment was too narrow and did not take into account the "significant benefits that can flow into business as a result of wider behavioural change, product and service innovation and other strategic advantages".

IV. CONCLUSION

Corporate climate change disclosure forms part of the infrastructure for providing decision-makers with information that will enable them to integrate climate considerations into their analyses, and to help better align business practice with climate change mitigation and adaptation plans and sustainable development goals.

The analysis of mandatory corporate climate change reporting schemes in G20 countries shows that there are some commonalities, but also significant divergences between the reporting requirements, the scope and quality of the reported information, and the measures used by governments to enforce the schemes.

The schemes introduced in G20 countries include, and often share, a number of characteristics, including: explicit requirements to report direct (Scope 1) GHG emissions for the six so-called “Kyoto gases”; requirements for (some kind of) verification of reported information; specification of the approach to be used for the preparation of reported information. The vast majority of mandatory corporate reporting schemes examined for this report do not consider reporting of indirect (or Scope 3) GHG emissions, and when they do, this type of reporting is normally recommended rather than required.

The main differences between G20 country schemes relate to the thresholds, measurement approaches, for example by estimation or direct methods, calculation formulae, units and emission factors, verification or assurance requirements, and penalties for non-compliance.

The analysis evidences the multiplicity of reporting requirements under the different schemes, which may render the evaluation and comparison, and thereby the use of the information, difficult. Whilst significant developments are being made in corporate climate change reporting, it remains a relatively young discipline facing multiple challenges associated with the fragmentation and diversity of reporting requirements, technical challenges, costs, etc., all of which may limit the effective use of corporate climate change information in decision-making.

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This report takes stock of mandatory climate change reporting schemes in G20 countries and identifies commonalities and divergences between the various schemes.

The research underlying this report was undertaken as part of the project Aligning Policies for the Transition to a Low-carbon Economy, conducted jointly by the OECD, the International Energy Agency, the International Transport Forum and the Nuclear Energy Agency, which analyses possible misalignments between existing policy frameworks and climate policy objectives. The report also builds on work undertaken in the context of the chapter on Disclosure of the OECD Guidelines for Multinational Enterprises.