

Emissions Reductions and Lower Carbon Intensity: Are We Making Progress?



Center for
BUSINESS AND THE ENVIRONMENT
at Yale

CARING FOR CLIMATE SERIES

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Foreword

Caring for Climate (C4C) was introduced by United Nations Secretary-General Ban Ki-moon in July 2007. The Secretary-General challenged Global Compact participants to exercise leadership on climate issues by:

- making climate change a leadership issue for strategy and operations;
- setting emission reduction targets and exploring low-carbon technologies;
- supporting public policy efforts aimed at achieving low carbon economies;
- sharing experiences and publicly disclosing progress made on an annual basis.

Less than two years on, Caring for Climate has emerged as the world's largest and most diversified business engagement platform on climate, with more than 350 corporate signatories in over 60 countries.

Less than seven months before the crucial UN Climate Change Conference in Copenhagen, we are releasing several new research studies and reports, the Caring for Climate Series, to offer a range of perspectives on the role of business and investors in tackling climate change. It is our hope that the findings of the C4C Series will inspire more businesses to make climate change a priority issue, so that policy makers will feel more confident that business is ready to be part of the solution.

The good news is that businesses from all regions and sectors have already started their journey towards energy efficiency, innovation and GHG emission reductions. Indeed, in many instances businesses have embraced climate action as an opportunity to drive efficiency and to gain competitive advantages, even where Governments have not yet taken action.

Caring for Climate participants recognize that climate change is not only an environmental issue. Around the world, businesses are beginning to feel the economic impacts as well. Consequently, some have made the connection between mitigation and adaptation, putting in place long-term measures to address not only emissions, but also food and water concerns and related natural resource issues. In fact, this drive towards energy efficiency and carbon reductions, combined with a proactive management of systemic climate risks, is defining a new level of environmental stewardship. Long-term investors, asset managers and analysts are also beginning to integrate these considerations into investment analysis and decision-making.

The bad news is that, despite encouraging and inspiring leadership, the number of businesses that are actively addressing climate change is far too small. Too many are still sitting on the fence waiting for others to act first.

What is needed now is Government leadership to produce a clear incentive structure that favors good performance and a global deal on climate change that creates certainty. Governments should be confident that change is possible. If Caring for Climate is any indication, business and investors certainly have the capacity and understand the compelling case for taking action. We therefore hope that the C4C Series will give policy makers and negotiators the confidence and inspiration to bring the Copenhagen Climate Conference to a successful conclusion.

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Executive Summary

This project conducted an assessment of the public disclosures of greenhouse gas (GHG) emissions of large companies that are participating in the “Caring for Climate” (C4C) program within the UN Global Compact (UNGC). We briefly describe our findings here. The analysis began in September 2008 and includes large companies that were signatories at that time, with the objective of identifying progress toward disclosure and more generally toward the objectives described in the C4C business leaders’ statement. We analyzed Communications of Progress (COPs). In addition, roughly 40% of C4C large company signatories are participants in the Carbon Disclosure Project (CDP). Reporting formats for CDP are far more amenable to systematic collection and analysis of data, therefore we relied heavily on CDP data for those firms participating in that program.

The data presented in this report are based on publicly available sources: primarily COPs submitted to UNGC and reports from the CDP, for firms participating in that parallel program. Given the multiple data sources utilized and the volume of data scrutinized, it is possible that errors or omissions occurred. We wish to enlist the signatories themselves in this assessment of progress. If errors or omissions are apparent in this overview, please contact the authors with corrections. The analyses will be updated regularly.

The analysis covered 145 large firms out of 166 that were signatories to C4C as of September 2008. The firms originate in 40 countries and represent 16 distinct business sectors. From the analysis, it is clear that accounting for firm-level GHG emissions presents a challenge to many companies. As the explanatory note attached to the C4C Business Leaders’ Statement acknowledges, many C4C participants currently, “do not have the capacity to measure their GHG emissions due to size and other organizational characteristics” (p.2). By analyzing Communications of Progress (COPs) and other forms of public disclosure, we find that of the 145 participants analyzed:

- 89 companies (61%) report at least one year of total emissions
- 65 companies (45%) report disaggregate

- emissions (for example, into Scope 1, 2, and/or 3)
- 55 companies (40%) report an emissions or energy intensity
- 70 companies (48%) report more than one year of emissions, which permits a trend analysis
- 20 companies (14%) report more than one year of intensity, permitting a trend analysis in that metric
- 57 companies (40%) have set some kind of climate change mitigation target
- 20 companies (14%) report emissions reductions
- 12 companies (9%) report intensity improvements
- 3 companies (1.4%) report simultaneous intensity improvements and emissions reductions
- 58 companies (40%) report no climate-related data (either they have not submitted COPs, or they submit COPs containing no climate change information).

Thus, well over half of the C4C signatories now collect and publicly disclose *some* GHG emissions data. Nearly half provide sufficient data to start tracking emissions over time, and this proportion should increase in the coming years. However, the trends that are reported at this stage should be interpreted with care. It is apparent from the public disclosures that many firms are still establishing an accounting methodology. Some of the changes in GHG emissions documented in this report are the result in changes in accounting rather than actual changes in pollution. In addition, large companies frequently merge with others and/or divest holdings, which can have dramatic effects on their net emissions. The data cited above does not account for these types of accounting-induced reductions; however, we make note of changes in accounting methods and company mergers/divestitures when that information is disclosed by the firm. We also note when large discrepancies are apparent, but not explained in companies’ public disclosures.

The firms participating in C4C are responsible for a wide range of GHG pollution. Five firms report annual emissions exceeding 100 million tons of CO₂-e: larger than the annual

emissions of Denmark and Sweden combined. Eight firms in the sample emit less than 10 ktCO₂. Table 1 and Table 2 show the ten highest and lowest emitting firms among C4C signatories disclosing emissions.

Meaningful action on climate change requires contributions from all firms and sectors. GHG emissions need to be reduced in order to avoid “dangerous anthropogenic interference to the climate system”¹. The data reveal 20 out of 145 firms report that they

have reduced emissions in the recent past. The top ten reducers in absolute terms are given in Table 3, and the top ten in relative terms are given in Table 4 (See Appendix A for a list of all firms in the sample ranked by magnitude of relative emissions reductions over time).

¹ This is the language used in Article 3 of the UNFCCC. See also, Schneider, S. and Lane, J. (2006). An Overview of ‘Dangerous’ Climate Change. In Avoiding Dangerous Climate Change. H. J. Schellnhuber, et al. Eds. Cambridge, UK, Cambridge University Press: p. 7-23.

Table 1: Ten firms with the largest current GHG emissions

Company (sector)		Annual Emissions	
		ktCO2	Year
1	Eskom (Utilities)	223,600	2008
2	Repsol YPF (Oil and Gas)	202,413	2007
3	RWE AG (Utilities)	152,500	2007
4	E.ON AG (Utilities)	124,560	2006
5	Lafarge (Construction & Materials)	106,518	2007
6	OMV Aktiengesellschaft (Oil and Gas)	94,194	2007
7	Suez (Utilities)	83,422	2007
8	EDF (Utilities)	78,300	2006
9	Sasol Ltd. (Chemicals)	70,343	2007
10	ENI (Oil and Gas)	67,556	2007

Table 2: Ten firms with the smallest current GHG emissions

Company (sector)		Annual Emissions	
		ktCO ₂	Year
1	Landsbanki (Financial Services)	1	2007
2	Piraeus Bank (Financial Services)	1	2007
3	Scott Wilson Holdings Ltd. (Industrial Goods & Services)	2	2007
4	AvivaSA Emeklilik ve Hayat (Financial Services)	3	2007
5	Korea National Housing Corporation (Construction & Materials)	3	2005
6	Sekem Group (Food & Beverage)	5	2007
7	Sabaf SpA (Personal & Household Goods)	9	2007
8	Lindex (Retail)	10	2007
9	Development Bank of the Philippines (Financial Services)	14	2004
10	Essilor International (Health Care)	32	2006
* Infosys reports their 2007 emissions were just over 200 tons CO ₂ (CDP6). This is equivalent to about 3 US households. While we believe this is an error, we include it here because it is their disclosure.			

Table 3: Ten firms reporting the largest absolute decrease in GHG emissions on an annual basis.

Company (sector)		Change in Emissions		Comments
		ktCO2/yr	Years	
1	Anglo American (Basic Resources)	-11,928	2006-2007	Large decrease is due to two major divestitures in 2007 and a methodological change in the way the firm reports fugitive emissions (CDP6 submission)
2	EDF (Utilities)	-3,116	2004-2006	Firm does not disclose total emissions. For this analysis, emissions were estimated from published intensity and production data.
3	Dupont (Chemicals)	-1,199	1990-2008	Extended time series of data shows significant emissions reductions.
4	Japan Airlines (Industrial Goods & Services)	-771	2006-2007	JAL reduced fuel consumption per available ton-km by 16% in FY2007
5	Unilever (Food & Beverage)	-343	2002-2007	Reduction accounts for scope 1 and 2 only. CDP5 and 6 include Scope 3 emissions approaching 200 MtCO2 (from consumer end-use of products).
6	The Coca-Cola Company (Food & Beverage)	-195	2003-2007	Firm reduced emissions and intensity. CDP6 report on 2007 emissions included ~15 MtCO2 in Scope 3, not included in this analysis.
7	ABB Ltd. (Technology)	-164	2006-2007	Firm only reports intensity data for 2006 - no trends are available.
8	Johnson Controls, Inc. (Automobiles & Parts)	-135	2002-2007	Most of the reductions are the result of correcting errors and omissions in data and methods previously used to estimate emissions (as explained in CDP 6).
9	Deutsche Telekom (Telecommunications)	-119	2004-2007	Through a combination of buying RECS, using CHP, and reducing electricity use, decreased emissions; no intensities reported.
10	Areva (Technology)	-115	2006-2007	Reductions were achieved by reducing SF6 emissions (used in electrical transmission equipment) and N2O emissions (used in production of UO3) (from CDP6).

Table 4: Ten firms reporting the largest relative decrease in annual GHG emissions

Company (sector)		Change in Emissions		Comments
		% per year	Years	
1	Akzo Nobel NV (Health Care)	-38%	2006-2007	Until 2006 the firm's CO2 emissions included emissions of non-consolidated joint venture cogeneration plants. Starting in 2007, the firm took these plants out their environmental accounting to be in line with our financial reporting.
2	Anglo American (Basic Resources)	-33%	2006-2007	See comment in Table 3
3	Development Bank of the Philippines (Financial Services)	-24%	2003-2004	Reduction reported for 2003-4, but more recent data is not disclosed
4	V & S Group (Food & Beverage)	-10%	2006-2007	Firm purchases carbon offsets; purchased 27,084 tCO2 in 2007 (40% of Scope 1 emissions).
5	ABB Ltd. (Technology)	-9%	2006-2007	Energy intensity was reduced 5% between 2005 and 2007.
6	Lindex (Retail)	-9%	2005-2007	The firm presents very detailed Scope 3 emissions from 2006 onwards.
7	Areva (Technology)	-8%	2006-2007	See comment in Table 3
8	Johnson Controls, Inc. (Automobiles & Parts)	-8%	2002-2007	See comment in Table 3
9	Infosys (Technology)	-8%	2006-2007	CDP6 submissions listed wrong units and UNGC website links to "Annual Reports" which do not contain emissions data. Correct information was obtained from Corporate sustainable Development Report at http://www.infosys.com/beyond-business/infosys-sustainability-report-0708.pdf
10	Unilever (Food & Beverage)	-7%	2002-2007	See comment in Table 3

Table 3 and Table 4 list emissions reductions that companies themselves disclose. However, as the comments indicate, some of the reductions are the result of divestitures or changes in accounting methods. In addition, many of the companies reporting reductions have disclosed data for only two years. In such cases, a longer time series is needed to determine whether the company’s emissions are systematically decreasing.

Emissions reductions may be achieved through advances in production and more efficient use of resources. Efficiency with respect to GHG emissions is measured as an “intensity” (emissions per unit output or per unit revenue). Intensities can be useful metrics; however, they must also be interpreted with care in order to avoid misleading information. In some cases, intensities alone may not be good indicators of emissions trends. This is particularly true in sectors that lack consensus on intensity metrics. For example, in service-oriented sectors, intensities may

be defined as emissions per employee, per unit revenue, or even per unit of office space. While each of these metrics may be associated with emissions, there are numerous other factors influencing office space, revenue, and the ranks of employees from year to year, making trends in these metrics difficult to interpret.

Even in the power sector, where emissions intensity is invariably defined in terms of pollution per unit of electricity produced (e.g. gCO2-e/kWh or some variation of these units), trends can be difficult to interpret at the firm-level because large firms may own numerous facilities using different types of fuel. Their holdings may change from year to year, leading to dramatically different ratios of emissions to output.

With these difficulties in mind, Table 5 lists the 20 firms in the sample that provided two or more years of intensity data ranked from largest improvement (intensity decrease) to largest increase in intensity.

Table 5: Changes in emissions intensity reported by C4C signatories

Company (sector)	Change in intensity			
	Current value	Units	Years	Annual change (%/yr)
V & S Group(Food & Beverage)	0.46	kg CO2/litre product sold	2004-07	-11%
COSCO (Industrial Goods & Services)	16.05	kg CO2 per kton-mile	2003-07	-9%
Tata Steel (Basic Resources)	2.13	tCO2e/unit output	2005-07	-4%
The Coca-Cola Company (Food & Beverage)	0.46	MJ per liter of product	2002-07	-4%
Seiko Epson (Technology)	47	Emissions per unit sales	2004-07	-4%
Union Fenosa (Utilities)		tCO2-e/MWh	2003-06	-3%
Unilever (Food & Beverage)	147	kg CO2 (from energy) per ton output	1998-08	-3%
Centrica (Oil and Gas)	390	g CO2/kWh (firm-generated power only)	2005-07	-3%
Hilti (Construction & Materials)	212	CO2-e per value added	2005-08	-2%
Fuji Xerox (Technology)	0.94	"eco-efficiency"	2000-06	-1%
Alcan Inc. (Industrial Goods & Services)	1.56	tCO2e per \$1000 sales	2001-05	-1%
Eskom (Utilities)	931	tCO2/MWh	2003-07	-1%
ABN AMRO (Financial Services)	3.93	tCO2 per FTE	2003-05	1%
RWE AG (Utilities)	861	tCO2-e/MWh	2003-07	1%
Allianz (Financial Services)	3900	kg CO2 per employee	2003-05	1%
EDF (Utilities)	120	tCO2/MWh	2002-07	2%
BBVA (Financial Services)	3.2	tCO2e per employee	2003-06	2%
Sasol Ltd. (Chemicals)	3.3	tCO2-e/ton output	2005-07	3%
DNV (Industrial Goods & Services)	2314	kg CO2 per person-year	2005-07	6%
Repsol (Oil and Gas)	45.6	tCO2e/bbl oil produced	2005-07	20%

Companies that report improvements in intensity (12/20) outnumber companies that report worsening performance (8/20). However, only three of the firms that report improving intensity also reduced emissions in the same period: Coca Cola, Unilever, and V&S Group.

The data also reveal 51 firms that have increased their emissions over the past few years. As with decreases in emissions, the increases may be the result of corporate

mergers or changes in accounting methods (e.g. adding Scope 2 or 3). Of course, increases may also be the result of more direct pollution from the firm's activities. Where possible, we note the underlying causes for large year-to-year variations in emissions. Table 6 and 7 show the ten firms responsible for the largest absolute and relative increases in emissions among the signatories sampled.

Table 6: Ten firms reporting the largest annual increases in GHG emissions (in absolute terms)

Company (sector)		Change in Emissions		Comments
		ktCO2/yr	Years	
1	Repsol YPF (Oil and Gas)	58,868	2003-2007	Large increase in total emissions is attributable to the inclusion of Scope 2 emissions in 2005 and Scope 3 in 2007. If only Scope 1 is considered, emissions increase by ~14% (3.5 MtCO2) between 2003 and 2007.
2	OMV Aktiengesellschaft (Oil and Gas)	43,520	2005-2007	Started reporting Scope 3 in 2007. If comparing only Scope 1, emissions increase by 70%. From 2005 to 2006, emissions nearly doubled due to the acquisition and integration of Petrom. Scope 2 is not reported.
3	Rio Tinto PLC (Basic Resources)	22,200	2006-2007	Scope 1 and 2 emissions increased ~80% between 2006 and 2007 because the firm acquired Alcan Inc, which emitted 20.9Mt CO2-e in 2007. In addition, in 2007 the firm reported Scope 3 emissions for the first time.
4	Lafarge (Construction & Materials)	10,518	2006-2007	Increase in emissions is due to a very slight increase in Scope 1 emissions and the inclusion of Scope 2 and 3. The firm reports that they have achieved 16% reduction in intensity to date (CDP6) and that it uses annual third party verification to monitor progress toward its targets.
5	Centrica plc (Oil and Gas)	9,967	2004-2007	Started reporting Scope 3 in 2007. If comparing only Scopes 1 and 2, emissions increase by 20%.
6	DONG Energy (Utilities)	6,936	2004-2006	Increase in emissions is the result of a large merger. In 2006, DONG merged with five other Danish energy companies (Elsam, ENERGI E2, Nesa, Copenhagen Energy, and Frederiksberg Forsyning) As a result, they absorbed a large portfolio of fossil fuel power plants.
7	Eskom (Utilities)	6,700	2003-2008	Increasing emissions; decrease in intensity
8	RWE AG (Utilities)	5,100	2002-2007	Currently emissions and intensity are increasing
9	Bayer AG (Chemicals)	4,627	2004-2007	The large increase is due to the inclusion of Scope 3 in 2007. If only Scope 1 and 2 are considered, emissions increase by just 3%.
10	UPM-Kymmene (Basic Resources)	4,417	2006-2007	Emissions increased due to the inclusion of Scope 2 and 3 in 2007. Comparing only Scope 1 reveals a 3% decrease in emissions. Intensities are not reported.

Table 7: Ten firms reporting the largest annual increases in GHG emissions (in relative terms)

Company (sector)		Change in Emissions		Comments
		% per year	Years	
1	DONG Energy (Utilities)	2408%	2004-2006	See comments in Table 6
2	OMV Aktiengesellschaft (Oil and Gas)	608%	2005-2007	See comments in Table 6
3	Munich Re Group (Financial Services)	326%	2003-2007	The firm reports a very large increase in emissions between 2006 and 2007, but offers no explanation. Prior to 2007, emissions had been increasing ~36%/yr.
4	Repsol YPF (Oil and Gas)	246%	2003-2007	See comments in Table 6
5	Fuji Xerox Company Ltd. (Technology)	135%	2000-2006	Started reporting Scope 2 and 3 in 2002. If comparing only Scope 1, emissions increased by 121% from 2000-2006. The increase appears to be attributable to improved reporting.
6	Centrica plc (Oil and Gas)	123%	2004-2007	Started reporting Scope 3 in 2007. If comparing only Scopes 1 and 2, emissions increase by 20%.
7	UPM-Kymmene (Basic Resources)	116%	2006-2007	See comments in Table 6
8	Rio Tinto PLC (Basic Resources)	79%	2006-2007	See comments in Table 6
9	Bayer AG (Chemicals)	62%	2004-2007	See comments in Table 6
10	RICOH CO. LTD (Industrial Goods & Services)	49%	2006-2007	Increase in emissions appears due to change in Scope 3 accounting. Scope 1 and 2 decrease 17% from 2006-2007.

In addition, 56 firms in the sample appear not to have disclosed any data on emissions, intensities, or targets. These firms are listed in the table below. However, this assessment is made with the caveat that some public disclosures may have been overlooked. If a firm appears here and data is publicly available, please contact the authors so that this assessment of progress can be updated.

- Abengoa
- AG2R LA MONDIALE
- Air India
- Airbus SAS
- Aksa Akrilik Kimya Sanayi A.S.
- APRIL
- Aramex PJSC
- Attock Refinery Limited
- Bancaja
- Broad Air Conditioning
- Central Warehousing Corporation
- China International Marine Containers Ltd.
- Consort NT
- Copagaz Distribuidora de Gas Ltda- Grupo Zahran
- Dudalina S.A.
- EADS France
- EADS N.V.
- Esquel Group of Companies
- Ferrocarrils de La Generalitat de Catalunya
- Groupe Bial
- Haier Group Company
- Interros
- Korea Land Corporation
- Korea Rail Road

- Li and Fung Limited
- LOC Maria
- Manpower
- Mansour Group
- MediaCorp
- Metito
- Narai Intertrade Co, Ltd
- NTUC Healthcare Co-operative
- Oil and Natural Gas Corporation Ltd.
- Pranda Jewelry Public Company Ltd
- Primex
- Pwani Oil Products Ltd
- Rahimafrooz Batteries Ltd.
- Samjong KPMG Inc.
- SAP
- Scottish & Newcastle plc
- Sedus Stoll AG
- Sing Lun Holdings
- Singapore Zoological Gardens
- SingHealth Group
- Store Steel
- Storebrand ASA
- Sunfood International Company
- Talal Abu-Ghazaleh & Co. International
- Tata Chemicals
- TCE Consulting Engineers Limited
- Teckwah Industrial Corporation Ltd
- Telefonica S.A.
- Telvent
- TITAN
- TOMS Gruppen A/S
- V. Mane Fils S.A.

1. Efforts in Carbon Disclosure

INTRODUCTION

In light of the occurrence of human-induced climate change, there is growing interest in identifying and reporting anthropogenic greenhouse gas emissions. At local, state, and national levels, individuals, private sector organizations and public institutions are demonstrating an increasing interest in moving toward carbon neutrality. Numerous initiatives have emerged in support of this trend: to inventory, understand take steps to reduce the carbon emissions that individuals and organizations are responsible for.

Calls have become particularly intense for the private sector to report emissions and take concrete steps toward emissions reductions. This pressure originates from within the companies themselves as well as investors, policy makers and consumers who all seek to make more informed decisions.

Each stakeholders' interests are described briefly:

- **Investors** — as evidenced by the Investors Summit on Climate Risk, an event held by Ceres, the UN Foundation, and the UN Fund for International Partnerships, that brings together hundreds of investors representing trillions of dollars of assets under management including those from state pension funds, colleges and universities, and other investors;
- **Companies and NGO's** — an alliance of major businesses and leading climate change and environmental groups in the U.S. that have recommended to the U.S. congress that it establish a national registry and inventory of greenhouse gas emissions and that houses data reported by all regulated entities; and
- **Consumers** — Consumers are becoming increasingly interested in lowering their "carbon footprints" either through directly reducing their emissions or purchasing offsets. Public disclosure about GHG emissions can help consumers make more informed decisions by favoring firms that demonstrate a commitment to emissions reductions. However, as with previous attempts to communicate complex environmental messages to consumers, there is a danger that overly complex data will be misinter-

preted or ignored. Thus, companies and promoters of public disclosure face a challenge in communicating these messages.

Acknowledging that there are a number of challenges and complexities associated with corporate GHG emissions accounting, a number of high-profile public initiatives have emerged to offer guidance and support. These initiatives include, but are not limited to the:

- **Greenhouse Gas Protocol** — an initiative of the World Resources Institute and World Business Council for Sustainable Development that has developed an accounting standard for quantifying, understanding, and managing one's greenhouse gas emissions;
- **Global Reporting Initiative** — established in the late 1990's by CERES, this initiative works with the UNEP and other stakeholders to establish sustainability reporting guidelines that can be used, for example, to meet the reporting requirements of the UN Global Compact's Communication on Progress; and
- **Carbon Disclosure Project** — a charitable project that establishes a process for measuring and disclosing emissions by providing assistance to more than 3,000 of the world's largest corporations — that emit an estimated 26% of greenhouse gases.

The information disclosed from these initiatives are used by many stakeholders including policy-makers, institutional investors, and the academic community that seek to understand the imminent risks and opportunities presented by a worldwide transition to a low carbon economy.

CSR, ESG AND BEYOND

The public disclosure of GHG emissions can be situated in a broader movement toward greater corporate accountability concerning social and environmental impacts. In the most general sense, these *Corporate Social Responsibility* (CSR), or *Environment, Social and Governance* (ESG) standards are defining new modes of relationships between corporations and society.



As might be expected, managing this information has given rise to a series of new products and services from the financial sector. These rely on carbon disclosure as a means of measuring and rating performance and intangible asset value to advise investors about the risks posed and opportunities created by a transition to a low carbon economy. These products and services include:

- **Carbon Beta** — a product of the RiskMetrics Group (formerly Innovest Strategic Value Advisors) that measures a companies net financial and competitive risk exposure to climate change influences by regulatory, public and consumer responses;
- **Climate Change Indexes** — a suite of products by HSBC that provide global reference indexes that track the stock market

performance of companies that are likely to benefit from a transition to a low carbon economy; and

- **Environmental Register** — a data repository developed by Trucost that collects and stores global corporate environmental data, including carbon emissions, from suppliers in order to communicate their environmental credentials to prospective buyers.

These market tools rely on the disclosure of accurate carbon emissions data by companies operating across all industry sectors throughout the world. Businesses and governments are making colossal decisions based on the carbon emissions data being measured and disclosed worldwide.

Challenges of Carbon Disclosure

As the late W. Edwards Deming once said, “the most important things we need to manage can’t be measured.” There are clearly significant challenges to both measuring and reporting carbon emissions. From the seemingly comprehensible direct Scope 1 and indirect Scope 2 emissions, to the obscure economy-wide Scope 3 emissions, companies that aren’t in the business of measuring their greenhouse gas emissions are suddenly being pressured by shareholders to contemplate their organizational boundaries in order to determine their emissions footprint.

Companies are beginning to undertake major initiatives to measure and report their greenhouse gas emissions using protocols akin to accounting standards. It should be pointed out that the Financial Accounting Foundation, an independent, private sector organization responsible for the oversight of FASB and GASB, was organized in 1972 for the key purposes of establishing and improving generally accepted accounting principles and reporting standards, and protecting the independence and integrity of the standard-setting process for measuring and reporting financial information about companies. Accounting standards change all of the time as we learn more and more about how to value assets. Given this experience, one would expect that the measurement and reporting standards for greenhouse gas emissions will undergo a similar history as that of accounting standards and that there will be many ongoing challenges in regards to data collection and reporting.

As we head towards Copenhagen and the Conference of the Parties 15 (COP 15), it will become increasingly important that we work towards developing better measurement and disclosure standards for carbon emissions by companies worldwide. The UN Global Compact’s “Caring for Climate” initiative represents an important opportunity to better understand the challenges of measurement and reporting that will help us identify the key issues to help us “make progress” towards reducing anthropogenic carbon emissions and its impact on the global climate.

Caring for Climate is a voluntary and complementary platform for UNGC participants seeking to demonstrate leadership on climate change. It is designed to advance

practical solutions and shape both public opinion and policy by requiring companies to identify voluntary actions to reduce their greenhouse gas emissions. Businesses that participate in this initiative, sign a Caring for Climate Statement whereby they commit to, among several things:

“Taking practical actions now to increase the efficiency of energy usage and to reduce the carbon burden of our products, services and processes, to set voluntary targets for doing so, and to report publicly on the achievement of those targets annually in our Communication on Progress.”

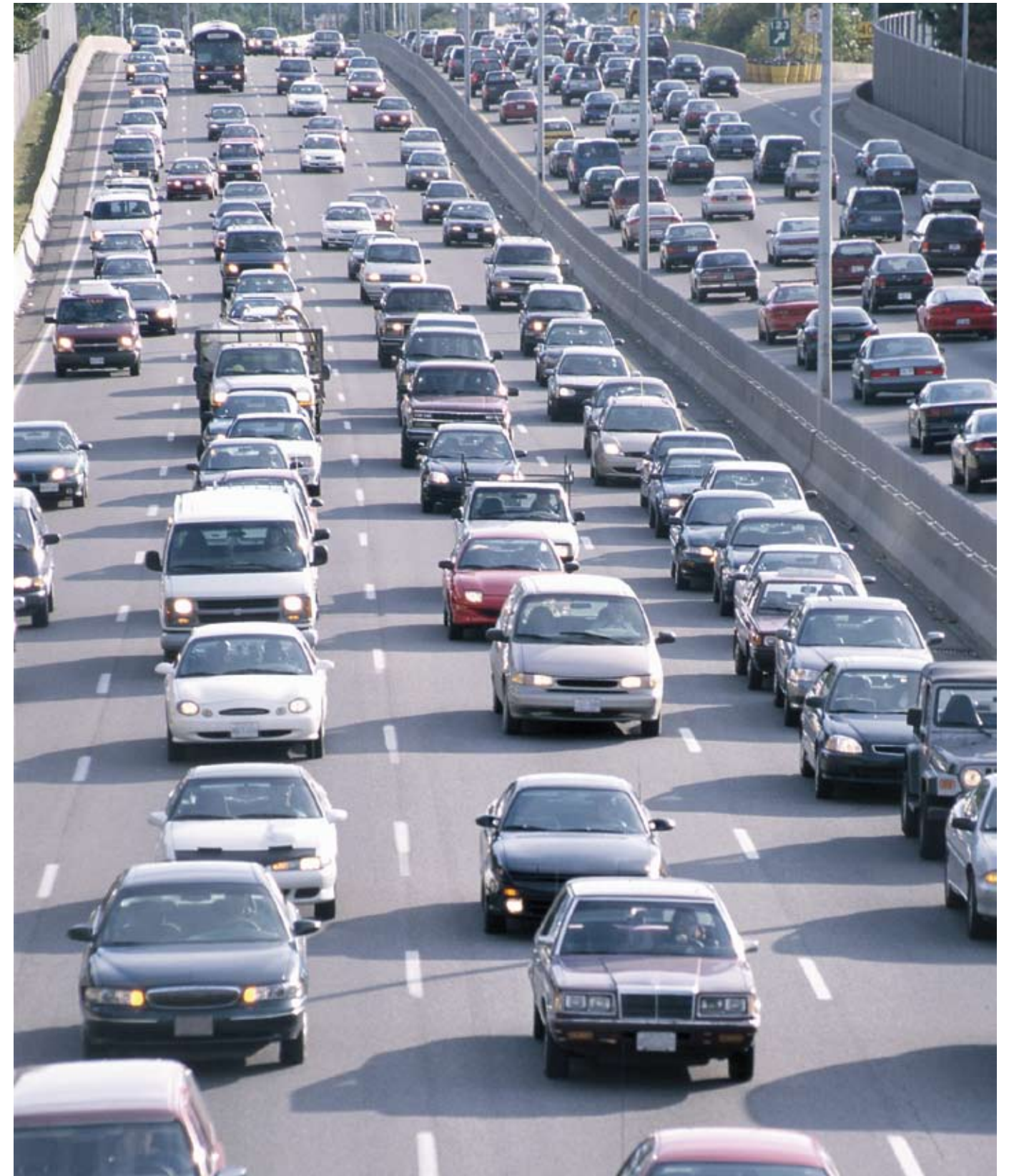
Through a Communication on Progress, companies can articulate both quantitative and qualitative data and objectives such as:

- **Quantitative** — the establishment of a baseline and measurable targets for greenhouse gas emissions, practices that increase the efficiency of energy usage, and the development of products, services, and processes that reduce carbon burden; and
- **Qualitative** — the continuous reinforcement of the company’s commitment to Caring for Climate, development of strategies to minimize risks to and identification of opportunities from climate change, and establishment of partnership projects with other businesses.

It is through the process of GHG accounting and reporting, and successfully implementing mitigation strategies businesses seek to:

“Engage fully and positively with our own national governments, inter-governmental organizations and civil society organizations to develop policies and measures that will provide an enabling framework for the business sector to contribute effectively to building a low carbon economy.”

Through an annual CoP, participating businesses in the Caring for Climate initiative commit to measuring and reporting their greenhouse gas emissions. It is through this communication and other means that this research project sought to assess public disclosures of greenhouse gas emissions and the progress being made by Caring for Climate participants.



2. What is “progress”?

Measures of progress included in this assessment are designed to recognize firm-level efforts to understand current emissions both in absolute terms and relative to other relevant measures of business performance (for example, production, revenue, or employment). Many firms are still in the early stages of action on climate change. Before concrete steps can be taken to reduce absolute emissions, firms must understand where emissions originate within their own operations as well as the suppliers and distributors over which they have influence. Progress can therefore be measured in terms of data collection, as well as reductions in relative or absolute or emissions.

REPORTING OF DATA

The act of collecting and disclosing data reflects progress in the sense that data collection is the first, necessary step in understanding the impacts of past and current practices as well as identifying opportunities for future reductions in emissions.

In order to make the act of ‘data reporting’ into a quantitative indicator of signatories’ progress, we identified a set of data and scored firms’ progress based on the number of indicators that they disclose. Admittedly, the choice of indicators is somewhat arbitrary. We chose a range of indicators that cover various issues about which C4C has expressed concern. These indicators are based on a number of questions that appear in the current CDP questionnaire (CDP6). We drew from the CDP questionnaire because CDP reporting follows a structured format. In contrast, while C4C COPs may contain a broad range of potentially useful information, they lack a consistent format and the data that they contain is difficult to “mine”.

Our indicator of progress on reporting data (P1) was based on the percentage of the following 13 data points reported by firms:

- Total Global Emissions
- Total Emissions occurring in Annex B Countries
- Scope 1 activity emissions globally
- Scope 1 activity emissions Annex B
- Scope 2 activity emissions globally
- Scope 2 activity emissions Annex B
- Electricity purchased and consumed globally

- % from renewables - globally
- Electricity purchased and consumed Annex B
- % from renewables - Annex B countries
- Total Scope 3 emissions
- Emissions reductions targets
- Current intensity data.

Note, progress in this category is based solely on whether or not firms provide data and does not reflect increasing or decreasing trends in emissions or intensities. For example, a firm makes progress in this sense even if their emissions are increasing over time, or if they fail to meet targets, provided that publicly disclose information.

SETTING TARGETS

Target-setting is a critical indicator of progress. The act of setting and disclosing a target indicates that key decision-makers within the company have put considerable thought into achieving environmental goals. It creates a potential for competitive advantage if the company is a leader in setting GHG mitigation targets. However, the companies also expose themselves to the risk of negative consumer perception and competitive disadvantage should the target go unmet.

Moreover, the nature of the target itself deserves attention. As section 3 demonstrates, C4C signatories have set a wide range of targets for themselves. Many are quite ambitious, while others do not reflect significant change from the status quo (see Appendix for specific targets). 56 signatories set targets in their COPs or CDP submissions. Targets based on absolute emission reductions (23/56) slightly outnumber targets that aim to improve emissions intensity (19/56). There are also a fraction of targets (14/56) that aspire to achieve emissions reductions indirectly or in well-defined segments of business operations, but do not necessarily guarantee firm-wide improvements: e.g. reducing air travel, shifting companies purchased electricity toward renewable sources of power, or initiating energy efficiency programs.

REDUCING ENERGY USE, INTENSITY, OR EMISSIONS

Targets may be indicators of progress in the sense that they indicate an organizational desire to reduce climate impacts, but

meaningful progress toward climate change mitigation is measured in emissions reductions. Of course, demonstrating emissions reductions at the company level requires that companies begin with disclosing emissions data, as described in section 2.a above. Such disclosures must occur over an extended period of time and in a consistent manner so that comparable sources of GHG emissions are reported year-after-year. Many of the firms in this study have just begun to do this. 29 out of 70 firms reporting time series report just two years of emissions data. The balance of firms report data for three years or more. However, as the detailed analysis in Section 3 shows, it is clear that many firms are still ironing out methodological issues related to accounting for emissions. This is particularly true for Scope 3 emissions, which are difficult to assess even for highly adept firms. Roughly 30 firms have started reporting Scope 3 emissions, but they do so for a wide and inconsistent mix of Scope 3 categories including business travel, supply chain emissions and product distribution, as well as end-use and disposal. This range makes it difficult to compare emissions that include Scope 3 components.

Improvements in emissions intensity and reductions in energy consumption can serve as complementary indicators of progress to emissions reductions. This is particularly true for firms that are experiencing rapid growth, when emissions reductions are simply not compatible with the organization’s mission.

PARTICIPATION IN EMISSIONS TRADING AND OFFSET SCHEMES

A final indicator of progress toward climate change mitigation is participation in emissions trading and carbon offset schemes. It may not be possible for firms to meet voluntary emission reduction goals or mandated targets purely through in-house emission reductions. This is particularly true for firms that have set a goal of becoming fully carbon-neutral.

Emission trading is based on emission allowances granted under cap and trade schemes. It allows firms that can reduce emissions cheaply to sell their allowances to firms that are burdened by more costly emis-

sions. This typically occurs in the context of mandated emissions reductions (or, in the case of the CCX, a scheme in which firms voluntarily accept a cap on their emissions).

Offset schemes allow firms to invest in projects that reduce another party’s emissions below a projected baseline or buy the offsets created when other make such investments. This is the basis of the CDM and JI, two offset mechanisms meant to assist parties to the Kyoto Protocol meet their emission reduction obligations. Voluntary offset schemes follow a similar principle.

Our analysis shows that roughly 30 C4C signatories have facilities that fall within the EU-ETS. A similar number are participating in CDM or JI either directly through investment in projects or through the purchase of offsets generated by project activities. A smaller number, roughly 12 signatories, are participating in other trading programs such as those that are emerging in the US and Australia. See section 3 for a sector-by-sector review of company activity in this arena.



3. Sectoral assessments

AUTOMOBILES & PARTS

- Firms participating in C4C:
 - Johnson Controls, Inc.,
 - Rahimafrooz Batteries Ltd.
- Number of firms participating in C4C: 2 (1 from non-Annex 1 parties)
- Number of firms analyzed in this report: 2 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 50%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 50%
- Firms showing a reduction in absolute emissions during reporting period: 1 of 2 firms

Of the two firms in this sector, only Johnson Controls provides significant amounts of data. They provide a time series of total emissions running from 2002-2007. The data they provide reflects a 30% reduction in total emissions over that time period; however, the firm attributes improvements in accounting rather than actual reductions. They write:

Amounts reported herein are substantially less from that reported previously. Most of the differences resulted from continuing efforts to improve overall accuracy; mostly correcting errors and omissions with source data previously used

to estimate emissions. Some methodology changes as a result of our third party audit also resulted in changes from that reported previously. We anticipate that future data changes will become less significant as accuracy of the source data and processes to calculate total emissions improve².

- Emissions intensity:
 - Percentage of firms reporting intensity: 50%
 - Sectoral Definition(s): Johnson Controls defines a revenue based intensity.

In addition, they disaggregate this intensity into Scope 1 and 2 as requested in CDP6 question 3(b)ii.

- Percentage of firms showing a reduction in emissions intensity: Neither firm reports time series of their intensity data.
- Percentage of firms setting targets: 50%
Johnson Controls have set a target of reduce its Scope 1 and 2 emissions by 30 percent per dollar revenue from 2002 to 2012.

² From Johnson Control’s submission to CDP6, question 2(f).

Table 8: Emissions intensities reported in the Automobiles & Parts sector

Firm	Intensity measure	Most recent value reported
Johnson Controls, Inc	tCO2-e per million USD in revenue.	48

Table 9: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Johnson Controls, Inc	15	33

- Percentage of firms using offsets: 0%
Firms in this sector do not report the use of offsets.
- Scope coverage:
Johnson Controls is one of the strongest firms in this regard. They report emissions from Scope 1, 2 and 3 from 2002-2007. Their Scope 3 emissions are currently limited to business travel. They hypothesize that Scope 3 is likely dominated by equipment suppliers; however, they identify a lack of capacity among some of suppliers as a major obstacle to developing an accurate assessment. Figure 1 gives a breakdown of emissions by Scope for each year.

BASIC RESOURCES

Sector overview

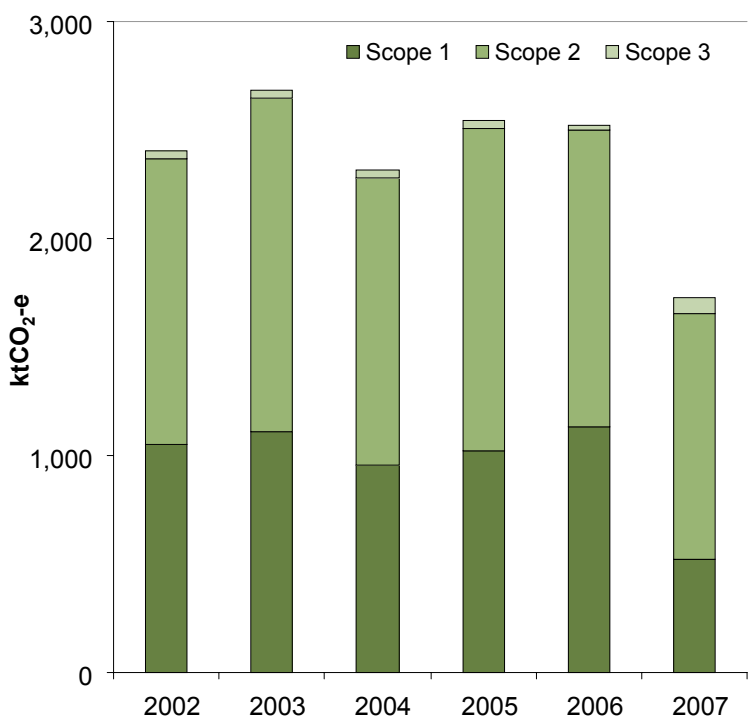
- Firms participating in C4C:
 - Anglo American
 - APRIL
 - Holmen AB
 - Newmont Mining Corp
 - Rio Tinto PLC
 - RUSAL
 - Store Steel
 - Tata Steel
 - UPM-Kymmene
- Number of firms analyzed in this report: 9 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 89%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 56%
- Firms showing a reduction in absolute emissions during reporting period³: 2 out of 9 firms

Five out of nine firms reported two or more years of emissions data. Of these, Anglo American showed substantial reductions between 2006 and 2007. In addition, Rio Tinto and UPM- Kymmene both showed large increases. Each deserves additional comment.

Anglo American

Between 2006 and 2007 Anglo American’s overall emissions decreased from 36.4 to 24.5 Mt CO2-e . This decrease in emissions is largely due to two major divestitures that occurred in that time: Highveld Steel and Vanadium and Mondi Group. An additional 800 kt CO2 is accounted for by a methodological change in

Figure 1: Johnson Controls GHG emissions by Scope (2002-2007)



the way that Anglo American reported fugitive emissions resulting from spontaneous combustion in waste dumps emissions at the New Vaal colliery in South Africa⁴.

Rio Tinto

Rio Tinto reported an increase in Scope 1 and 2 emissions between 2006 and 2007 from 28 to 50 Mton CO2, an increase of ~80%. In addition, in 2007 they reported Scope 3 emissions for the first time, which eclipse Scope 1 and 2. The increase in Scope 1 and 2 is attributed largely to the firm’s acquisition of Alcan Inc, which emitted 20.9Mt CO2-e in 2007. If Alcan’s addition is discounted, Rio Tinto’s 2007 total emissions were 28.3Mt, roughly the same as in 2006. However, note since 2003 their total emissions have increased 3.8Mt (~15%) (CDP6).

³ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.
⁴ There is no internationally accepted methodology for estimation of emissions from spontaneous combustion of waste sites. Anglo’s new estimate was made by Prof. Martin de Wit of Cape Town University using an approach informed by the CSIRO, an Australian research organization (from Anglo American’s submission to CDP6).

UPM- Kymmene

UPM- Kymmene reported an increase from 3.8 to 8.2 Mt CO2 between 2006 and 2007. This increase is simply the result of including Scopes 2 or 3 in their assessment in 2007. Comparing Scope 1 in 2006 to Scope 1 shows virtually no change in emissions.

- Emissions intensity:
 - Percentage of firms reporting intensity: 56%
 - Sectoral Definition(s): Six out of nine firms in this sector are CDP participants. Of these, four firms, which produce a fairly homogeneous set of products (either paper or steel) report intensities based on mass of product output as shown in the table below:

Table 10: Emissions intensities reported in the Basic Resources sector

Firm	Intensity measure	Most recent value reported
Holmen	Tons of CO2-e per ton output	0.137
Newmont Mining Corporation	Tons of CO2-e per gold ounce equivalent sold. Gold ounce equivalents equalize the production figures of Newmont's copper operations to give a more realistic perspective of emissions intensity.	0.49
Tata Steel	Tons of CO2-e per ton output	2.13
UPM-Kymmene Corporation	kg CO2 per ton of paper	323

The other two firms participating in CDP are large mining companies producing a diverse set of outputs. They have difficulty defining a single meaningful metric. Anglo American describes it this way:

*We produce a range of products and are aiming to produce intensity metrics on a per tonne basis for each product. We cannot meaningfully aggregate these product intensities to give a company intensity metric.*⁵

Four firms also report intensities from Scope 1 and Scope 2 emissions in terms of revenue as requested in CDP6 question 3(b)ii. These are shown in the table below.

⁵ Anglo American's response to Question 3(b)i of CDP6. Available at http://www.cdproject.net/responses/public/Anglo_American_6588_Corporate_GHG_Emissions_Response_CDP6_2008.asp

Table 11: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Anglo American	548	508
Holmen	127	118
Newmont Mining Corporation	522	178
UPM-Kymmene Corporation	0.27	0.24

Though they are grouped in the same C4C sector, these firms are not directly comparable. Anglo American and Newmont are mining companies. Anglo American mines a wide range of ferrous and non-ferrous metals as well as coal and diamonds. Newmont primarily mines gold, though also extracts copper. The firms have similar revenue-based emissions intensities but differ in Scope 2. Holmen is a paper manufacturer; UPM also makes paper, but has a more diverse portfolio

of activities including energy production and engineered wood materials.

- Percentage of firms showing a reduction in emissions intensity: 11% Only one firm reports more than one year's intensity measure in CDP6. This is Tata Steel, which showed an 8% improvement in intensity, as defined above, between 2005 and 2008.
- Percentage of firms setting targets: 56%

Table 12: Emission reduction or intensity targets described in COPs or CDP submissions in the Basic Resources Sector

Anglo American Plc	Reduce carbon intensity by 10% from 2004 to 2014 Reduce energy intensity by 15% over the same period
Holmen	The Swedish units shall reduce their fossil fuel use by 90% by 2020, which corresponds to 240,000 tons of carbon dioxide emissions. The group's energy efficiency shall have improved by 15% by 2020.
Rio Tinto plc	Five percent improvement in energy efficiency between 2003 and 2008 and a four percent improvement in greenhouse gas emissions efficiency between 2003 and 2008.
Tata Steel	Internal target to reduce the carbon emission level from 2.13 to 1.8 tCO2 per ton output by FY 2010
United Company RUSAL	50% reduction of GHG by 2015

- Experience with emissions trading and offsets:
Among the six firms that are CDP participants, three have facilities affected by the

EUETS, two have participated in the CDM market, and one firm has also worked in another crediting scheme. Details are given in the table below.

Table 13: Basic Resources firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

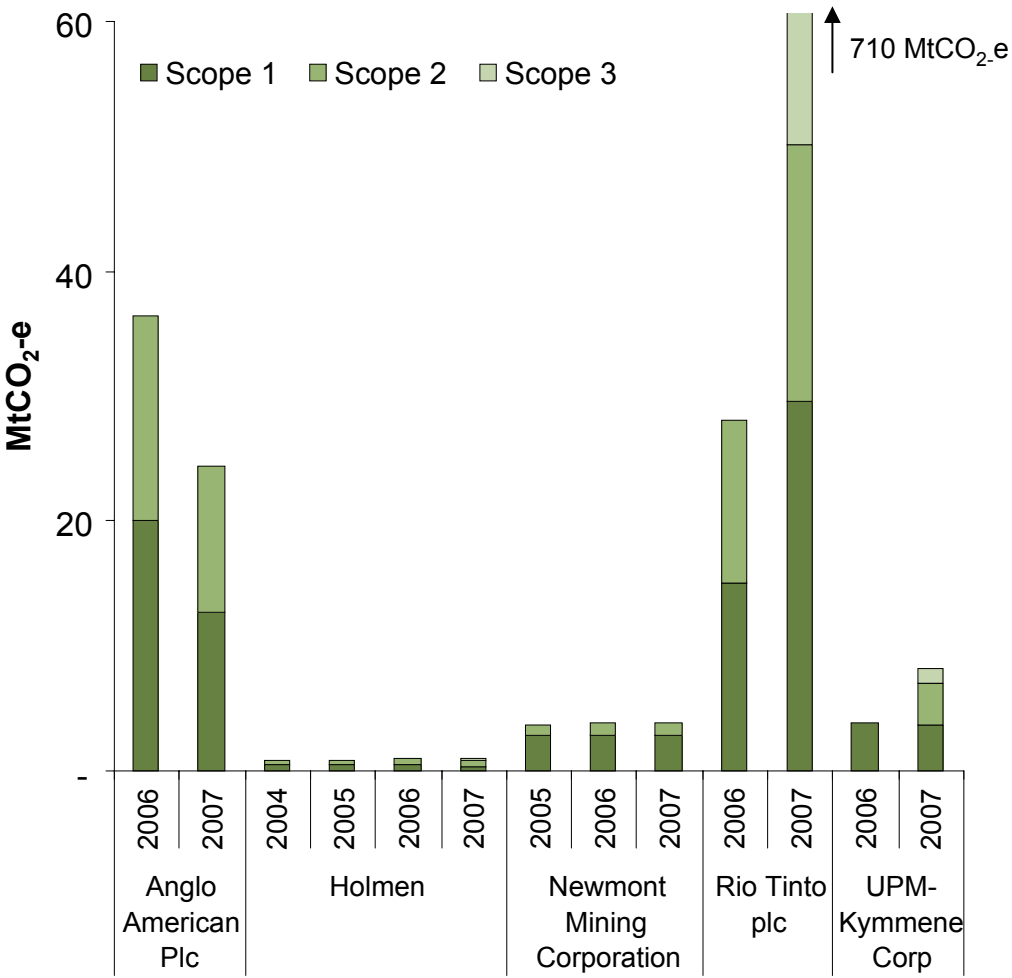
Firm	EUETS	CDM/JI	Other
Anglo American	Yes	Yes (projects through Highveld and Mondi, which were both recently divested)	NSW GHG abatement scheme
Holmen	Yes		
Newmont Mining Corporation	No		Would consider CCX
Rio Tinto	Yes		
Tata Steel	No	Would consider CDM projects as CER supplier	
UPM-Kymmene Corporation	Yes	Yes (through the purchase of CERs)	

- Scope coverage:
Five firms in this sector disaggregate emissions into Scope 1 and 2. Three of these firms report Scope 3 emissions as well. The breakdown is shown in Figure 2 below.

This sector largely reports an even division between Scopes 1 and 2 as the extraction of basic resources requires substantial energy produced by the firm as well as purchased power. Even when Scope 3 is reported, the relative magnitudes of Scope 1 and 2 are similar. Among those firms reporting Scope

3, Rio Tinto is a clear outlier. Already the largest Scope 1 and 2 emitter in this cohort, Rio Tinto's Scope 3 emissions, which are only reported in 2007, exceed their other emissions by more than a factor of 10. This is because they estimate emissions from downstream users of their products, which consist of coal for power production, iron ore for steel production, and bauxite for aluminum production - three extremely emissions-intensive industries.

Figure 2: GHG emissions by Scope in the Basic Resources Sector



CHEMICALS

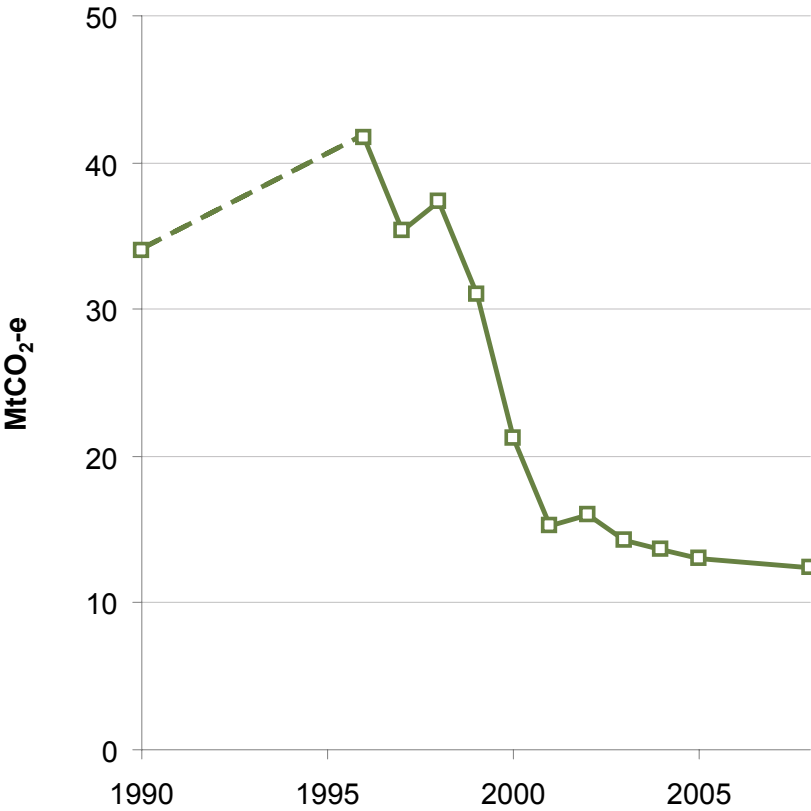
Sector overview

- Firms participating in C4C:
 - Akxa Akrilik Kimya Sanayi
 - Bayer AG
 - Dow Chemical
 - Dupont
 - Sasol Ltd.
 - Tata Chemicals
- Number of firms analyzed in this report: 6 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 80%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 40%
- Firms showing a reduction in absolute emissions during reporting period⁶: 2 out of 6 firms

Three out of six firms, Dow, Dupont, and Bayer, report more than one year of absolute emissions. Bayer's Scope 1 and 2 emissions increased slightly (2%) between 2004 and 2007 although they only began reporting Scope 3 emissions in 2007 so therefore it is not possible to assess the overall pattern over this period. Dow reports a 12% increase in emissions from 2006 to 2007, but this includes Scope 3 emissions that were not included in 2006. Comparing only Scope 1 and 2 reveals a slight decrease. Dupont reports an extensive time series dating back to 1990 (with several gaps). They show a decrease in absolute emissions of 64% over this period (shown in the figure below). Note their data is not disaggregated by Scopes.

⁶ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Figure 3: Dupont's total emissions from 1990 to 2008





- Emissions intensity:
 - Percentage of firms reporting intensity: 50%
 - Sectoral Definition(s):

Table 14: Emissions intensities reported in the Chemicals sector

Firm	Intensity measure	Most recent value reported
Bayer AG	Metric ton of CO2-e per ton product sold	0.72
Sasol Ltd.	Metric tonnes of CO2-e per tonne output	3.30
Dow Chemical Company	GHG emissions of CO2 equivalents per unit of production	0.55

In addition, two of the six firms report emissions intensities based on revenue in their submissions to CDP6. Note the massive dis-

parities between the two companies, which are not at all comparable in their product line or business operations.

Table 15: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Bayer AG	88	84
Sasol Ltd.	4528	633

- Percentage of firms showing a reduction in emissions intensity: 0%
Only one firm, Sasol Ltd. reported more than one year of intensity data and they report a 7% increase in intensity between 2005 and 2007.
- Percentage of firms setting targets: 67%

Table 16: Emission reduction or intensity targets described in COPs or CDP submissions in the Chemicals Sector

Dow Chemical Company	By 2025, Dow will stop the growth of absolute emissions of GHG within the company. Dow has also committed to reducing GHG intensity by 2.5 percent per year reduction in emissions per pound of produced product, from a 2005 baseline by 2015.
Dupont	Reduce total emissions by at least 15% by 2015 (using 2004 as a base year)
Bayer AG	Maintain emissions at 2005 levels until 2020. Achieve a 10 % reduction in specific energy consumption per ton of sales product by 2015.
Sasol Ltd.	Achieve a minimum of 10% reduction in GHG emissions per ton of product by 2015 using 2005 as a baseline. Achieve a 15% improvement in energy intensity by 2015 using 2000 as a baseline for all South African operations.

- Experience with emissions trading and offsets:
There are three firms in this sector that report emissions trading and offset activ-ity in their CDP submissions. Of these, all three have facilities within the EUETS. All have also participated in CDM/ JI either as direct project participants.

Table 17: Chemical firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

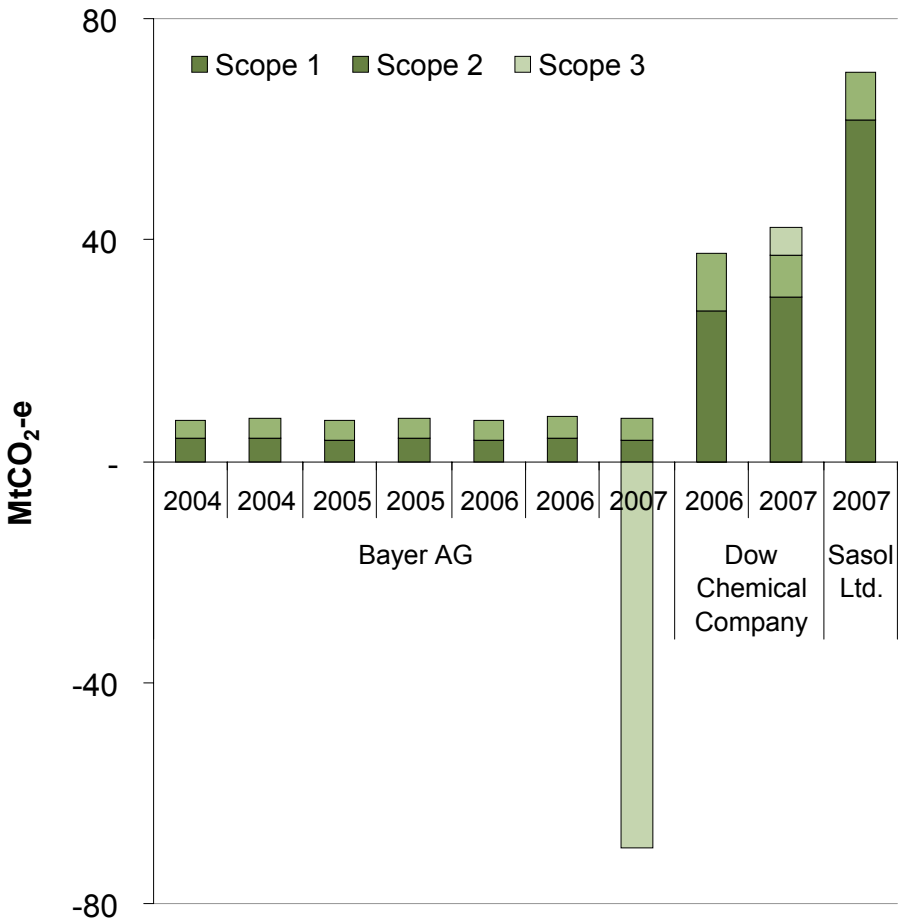
Firm	EUETS	CDM/JI	Other
Bayer AG	Yes	Purchased CERs	CCX
Dow Chemical Company	Yes	Plan to invest in CDM and JI projects that enable the offset emissions at plants and change the way their products are made (e.g introduced new process technologies that reduce carbon consumed as energy inputs or released during manufacture of products) (see CDP6 submission).	Midwestern Governor’s Association (MGA) Climate Accord
Sasol	Yes	Operations in South Africa participate in the CDM. Commissioned a committee of scientists, financial, tax, project developers and other specialists to optimize the benefits of CERs.	

• Scope coverage:
Bayer, Dow and Sasol disaggregate emissions by Scope 1 and 2. Bayer and Dow also offer some insight into Scope 3. All three firms maintain their own heat and power generation facilities such that Scope 1 emissions make significant contributions to their net emissions. The firms diverge quite a bit on Scope 3 reporting. Only two data points are available: Dow (and Bayer (both from CDP6). Both firms report employee air travel and upstream/downstream supply chain for their products. In addition, both mention that the use of

their products, which include insulating materials, leads to significant emissions reductions. Bayer actually quantifies this in their CDP6 submission and estimates that the use of their insulation material in buildings and lightweight materials in cars reduces three times more than their Scope 1 and 2 emissions, making them effectively a “carbon negative” company.

7 In CDP6 Bayer claims that their “product portfolio overall helps to abate significantly more GHG emissions (at least 93 Mt CO2e) than Bayer emits as a result of its business activities as a whole (Scope 1+2+3 Emissions: 31 Mt CO2e).”

Figure 4: GHG emissions by Scope in the Personal and Chemicals Sector⁷



CONSTRUCTION & MATERIALS

Sector overview

- Firms participating in C4C:
 - Autostrade per l'Italia
 - Energoinvest
 - Grupo Cementos Portland Valderrivas
 - Hilti
 - Korea Nat'l Housing Corp (KNHC)
 - Lafarge
 - Metito (Overseas) Ltd.
 - Metso Corporation
 - Skanska AB
 - TCE Consulting Engineers Limited
 - TITAN
- Number of firms analyzed in this report: 11 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 91%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 36%
- Firms showing a reduction in absolute emissions during reporting period⁸: None of the participants in this sector report an absolute decrease in emissions during the period for which publicly disclosed data is available. Of the eleven

participants, three firms report more than one year of emissions data (Hilti, KNHC, and Metso). Of these, Hilti and KNHC report steady annual increases 5-12% per annum. Only one firm, Metso, reports any annual decrease in emissions: a 9% decrease between 2005 and 2006. However, 2006 still represented an 8% increase relative to 2003, the first year of data available through CDP.

- Emissions intensity:
 - Percentage of firms reporting intensity: 18%
 - Sectoral Definition(s): The firms participating in this sector are also quite diverse, ranging from manufacturers of construction equipment to cement producers and toll motorway construction. Thus there is little agreement and reporting on intensity metrics. Only two firms, Hilti and Lafarge, suggest and report a metric. These are shown in the table below.

⁸ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 18: Emissions intensities reported in the Construction sector

Firm	Intensity measure*	Most recent value reported
Hilti	tCO2-e/value added*	209
Lafarge	tCO2-e per ton output	648
* This only refers to emissions from manufacturing plants (scope 1). In addition, the COP does not specify currency so this should not be compared to Lafarge's data in the table below.		

In addition, only one firm, Lafarge, reported intensities from Scope 1 and Scope 2 emis-

sions in terms of revenue as requested in CDP6 question 3(b)ii. Their

Table 19: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Lafarge	4318	335



- Percentage of firms showing a reduction in intensity: 9% Hilti reports intensity data from 2005-2008 and shows a 7% decrease in this time span. However, the data reflect a small 1% increase from 2007 to 2008.
- Percentage of firms setting targets: 55% (targets are described in the table below).

Table 20: Emission reduction or intensity targets described in COPs or CDP submissions in Construction Sector

Grupo Cementos Portland Valderrivas	16% reduction in CO2 emissions per ton of cement produced by 2012, using 1990 emissions levels as a baseline.
Lafarge	<ul style="list-style-type: none">• Net specific worldwide reduction of 20% per ton of cement (using 1990 baseline – achieved 16% reduction to date).• 10% reduction of their gross absolute CO2 emissions in Annex 1 countries (as part of this commitment, emissions are annually verified by a third party).
Skanska AB	<ul style="list-style-type: none">• 50% of global car fleet producing <130g cO2 per km by end 2010• By end 2010 full implementation of Energy Efficiency Best Practice Guides for maintenance, repair and replacement of their ten largest categories of heavy equipment - 7 Construction Business Units - covers ~1bn of company assets• By end 2010 full implementation in all buildings they own/occupy from itsEnergy Efficiency Best Practice Guide for Facility Managers.

- Experience with emissions trading and offsets: Lafarge is the only firm reporting emissions trading and offset activity in their CDP submissions. They have facilities falling under the ETS, and they have reg-

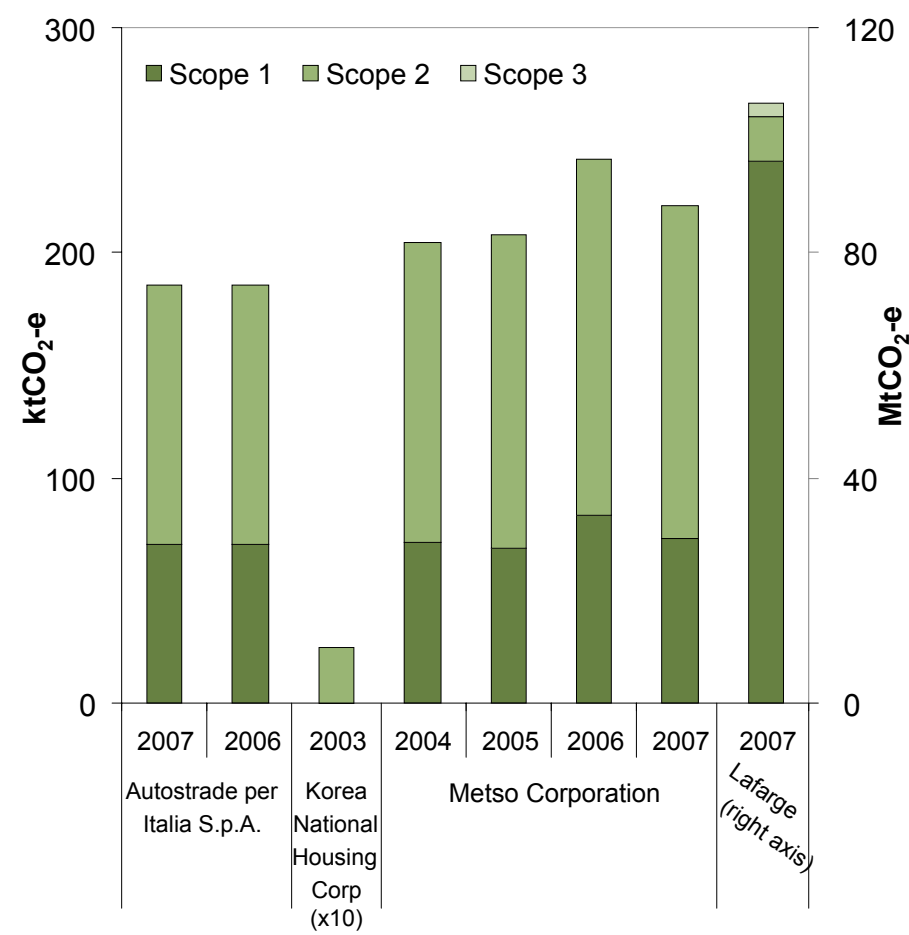
istered at least three CDM projects at the time of writing and intends to develop as many internal CDM projects as possible⁹.

⁹ See Lafarge's submission to CDP6 for a full description.

- Scope coverage:
Coverage of Scope 1 and 2 is fairly good, with 4 firms reporting at least one year. There is a wide variation among firms given the different core businesses included in this sector ranging from cement production to tool manufacturing. Only Lafarge

reports Scope 3 emissions (represented by employee travel and product distribution). As might be expected, they represent a small fraction of their total emissions. The firms reporting emissions by Scope are shown in the figure below.

Figure 5: GHG emissions by Scope in the Construction Sector (Lafarge is measured on right-hand axis)



FINANCIAL SERVICES

Sector overview

- Firms participating in C4C:
 - ABN AMRO
 - Allianz
 - Aviva plc
 - AvivaSA Emeklilik ve Hayat
 - Bancaja
 - BBVA, S.A.
 - Deloitte & Touche South Africa
 - Development Bank of the Philippines
 - Interros
 - Landsbanki
 - Munich Re Group
 - Nedbank Group
 - OCBC Bank Ltd.
 - Piraeus Bank
 - Sompo Japan Insurance Inc.
 - Storebrand ASA
 - Westpac Banking Corporation
- Number of firms analyzed in this report: 14 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 100%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 64%
- Firms showing a reduction in absolute emissions during reporting period¹⁰: 2 out of 14

In the Financial Services sector, 9 of the 14 firms analyzed report time series data for total emissions. Of these, only two show decreases in emissions: The Development Bank of the Philippines (DBP) and Westpac Banking Corporation. However, DPB only reports emissions data in their COP submissions in 2003 and 2004 so no trend can be established. Their more recent COPs lack emissions data.

- Emissions intensity:
 - Percentage of firms reporting intensity: 50%
 - Sectoral Definition(s): as in other service-oriented sectors, there are several, somewhat incompatible definitions of intensity. In this sector, intensities fall into two categories, emissions per unit of workforce and emissions per unit of office space. The table below describes intensities reported by firm:

¹⁰ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 21: Emissions intensities reported in the Financial Services sector

Firm	Intensity measure	Most recent value reported
ABN AMRO	t CO2 per FTE	3.93 (2005)
Allianz, SE	kg CO2 per employee (doesn't specify CO2 or CO2e)	3900 (2005)
BBVA, SA	t CO2e per employee	3.2 (2006)
Landsbanki Islands	t CO2e per employee	0.319 (2006)
Munich Re Group	t CO2e per employee	5.06 (2006)
Nedbank Group	Metric tons of CO2e per square meter	0.46 (2006)
Westpac Banking Corp.	t CO2e per employee	4.9 (2006)

In addition, 5 firms reported intensities from Scope 1 and Scope 2 emissions in terms of revenue as requested in CDP6 question 3(b)ii. These emissions are shown in the table below:

Table 22: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Allianz SE	0.51	2.91
Munich Re	0.11	3.03
Nedbank Group	0.179	30.03
Sompo Japan Insurance	0	42900
Westpac Banking	0.3	4.7

Emissions per unit of monetary turnover is fairly consistent across firms with the exception of Sompo Japan Insurance. The reason for this huge outlier is not clear.

◦ Percentage of firms showing a reduction in emissions intensity:
None of the firms in this sector report a reduction in intensity.

• Percentage of firms setting targets: 57%

Table 23: Emission reduction or intensity targets described in COPs or CDP submissions in the Financial Services Sector

ABN AMRO	"Carbon neutral" by 2008 (pledged in 2007)
Allianz, SE	20% GHG reduction group-wide by 2012
Aviva plc	5%, annually with a baseline year in 2006
Munich Re Group	10% emissions reduction: 2006-2012
Nedbank Group	These are intensity reduction targets (per employee) - energy: 12% reduction by 2015 (2004 baseline) to 5335kwh per employee (p.e.); water: 5% reduction by 2010 (2004 baseline) to 26.03kl p.e.; paper: 10% reduction by 2010 (2007 baseline) to .0594 tons p.e.; carbon emissions: 12% reduction by 2015 (2007 baseline) to 7.67 tons p.e.
SOMPO Japan Insurance	energy use: 5.9 % reduction by 2007 (with 2004 baseline)
Westpac Banking Corporation	5%, every year

• Experience with emissions trading and offsets:
None of the firms in this sector have facilities that fall under the EUETS, but several firms are active in the trading of EAUs. In addition, firms have both financed the development of CDM projects and traded in CERs

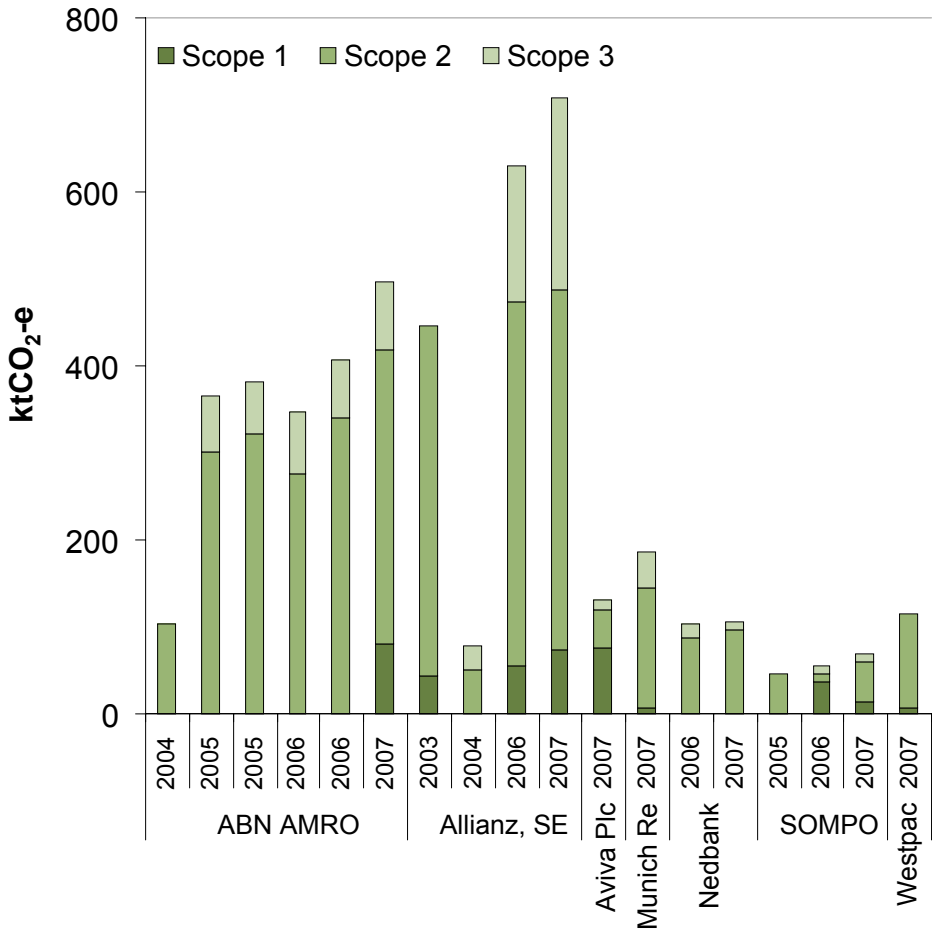
Table 24: Financial Services firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

Firm	EUETS	CDM/JI	Other
ABN Amro Holding	ABN AMRO is very active in the market for EU Allowances	ABN AMRO is also active in the market CERs and ERUs by sourcing credits and selling them back to corporate clients in the EU and Japan.	Not currently trading in other markets, but analyzing the possibility of involvement in the CCX.
Allianz SE			Provide "products and services" in support of emissions trading.
Aviva			Purchases Voluntary Emissions Reductions (VERs). Projects are situated in countries where Aviva has a presence or where there is "an urgent need for carbon finance - in Africa for example" (CDP6 submission).
BBVA		Finances CDM projects in Central America in collaboration with the Japan Bank for International Co-operation (JBIC) and the Central American Bank for Economic Integration.	
Munich Re		Considering CDM and JI projects with the aim of generating CERs	
Sompo Japan Insurance		In FY2006 developed and provided an assurance scheme CDM projects and will continue to research opportunities associated insurance, investment and loans for CDM projects.	
Westpac Banking	Established a dedicated team and commenced trading within the EUETS	Trade in CERs	Customers participate in the CCX and Westpac provides regular market updates. Westpac has traded RECs in Australia since 2002 and in the NSW GHG Abatement Scheme. They are also committed to being active participants in AETS and NZ ETS.

- Scope coverage:
Eight firms in this sector report emissions disaggregated by Scope 1 and 2. Six of these also report Scope 3 emissions. Not surprisingly, emissions in this sector are dominated by Scope 2. Among those re-

porting Scope 3, the majority provide data on employee business travel and a few also provide data on emissions from end-use, disposal and supply chain sources. Details are shown in the figure below.

Figure 6: GHG emissions by Scope in the Finance Sector



Some inconsistencies are apparent. These likely reflect difficulties with emissions accounting. For example, SOMPO's mix of Scope 1, 2, and 3 changes drastically from

2005-7. Even more apparent, in 2004 Allianz omits Scope 1 entirely and reports Scope 2 as only 10% of previous and subsequent years.

FOOD & BEVERAGE
Sector overview

- Firms participating in C4C:
 - Cadbury Schweppes PLC
 - Coca-Cola Hellenic
 - Danisco
 - Ebro Puleva S.A.
 - LOC Maria
 - Mansour Group
 - Pwani Oil Products Ltd
 - Scottish & Newcastle plc
 - Sekem Group
 - Sunfood International Company
 - Surfrut Ltda
 - The Coca-Cola Company
 - TOMS Gruppen A/S
 - Unilever
 - V & S Group
- Number of firms analyzed in this report: 14 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 57%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 36%
- Firms showing a reduction in absolute emissions during reporting period¹¹: 3 out of 14

In the Food and Beverage sector, 5 out of 14 firms report time series data for total emissions: Cadbury Schweppes, Coca-Cola Hellenic, The Coca-Cola Company, Unilever, and V&S Group. Of these, the latter three report actual reductions. Coca Cola decreased emissions by 14% between 2003 and 2007. V&S Group reduced their emissions by 10% between 2006 and 2007, and Unilever decreased their emissions by 37% from 2002 to 2007. However, these reduction calculations for Coke and Unilever omit Scope 3 emissions, because they were only included in the last one or two years.

- Emissions intensity:
 - Percentage of firms reporting intensity: 43%
 - Sectoral Definition(s): firms in this sector report intensity as either emissions or energy use per unit of output, where output may be in mass or liquid volume terms.

The table below describes intensities reported by firm:

11 The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 25: Emissions intensities reported in the Financial Services sector

Firm	Intensity measure	Most recent value reported
Cadbury-Schweppes	tCO2-e per ton output	0.22
Coca-Cola Hellenic	tCO2 per liter of beverage produced	76.6
Danisco	tCO2-e per tonne output	0.797
The Coca-Cola Company	MJ per liter of product produced	0.46
Unilever	tCO2 per ton product	0.15
V & S Group	MJ per liter of product	4.02

In addition, 3 firms reported intensities from Scope 1 and Scope 2 emissions in terms of revenue as requested in CDP6 question 3(b)ii. These emissions are shown in the table below:

Table 26: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Cadbury Schweppes	22.23	36.49
Coca-Cola Company	67	105.7
Unilever	21.98	28.49

◦ Percentage of firms showing a reduction in emissions intensity¹²: 14%
In this sector, two firms, The Coca-Cola Company and Unilever, reported time series of intensity data. Notably, both firms substantially reduced emissions per unit of output: Coke by 19% and Unilever by 25% between 2002 and 2007.

• Percentage of firms setting targets: 14%
Two firms, Cadbury Schweppes and Unilever report targets. These are shown in the table below:

¹² Only one firm, Coca-Cola, reported more than one year of intensity data in this sector. However, they report energy intensity so the reduction in GHG intensity can not be determined without disclosure of their energy mix.

Table 27: Emission reduction or intensity targets described in COPs or CDP submissions in the Food and Beverage Sector

Firm	Target
Cadbury Schweppes	10% reduction in emission intensity by 2012. They do not specify a base year, so presumably, it is based on the intensity of 2007 the reporting year, which was 0.22 ton CO2-e per ton of output.
Unilever	Reduce CO2 from energy (Scope 2 emissions) in their manufacturing operations by 25% by 2012 (measured per ton of production against a baseline of 2004).





- Experience with emissions trading and offsets:
Three firms have facilities that fall under the EUETS. In addition, The Coca Cola

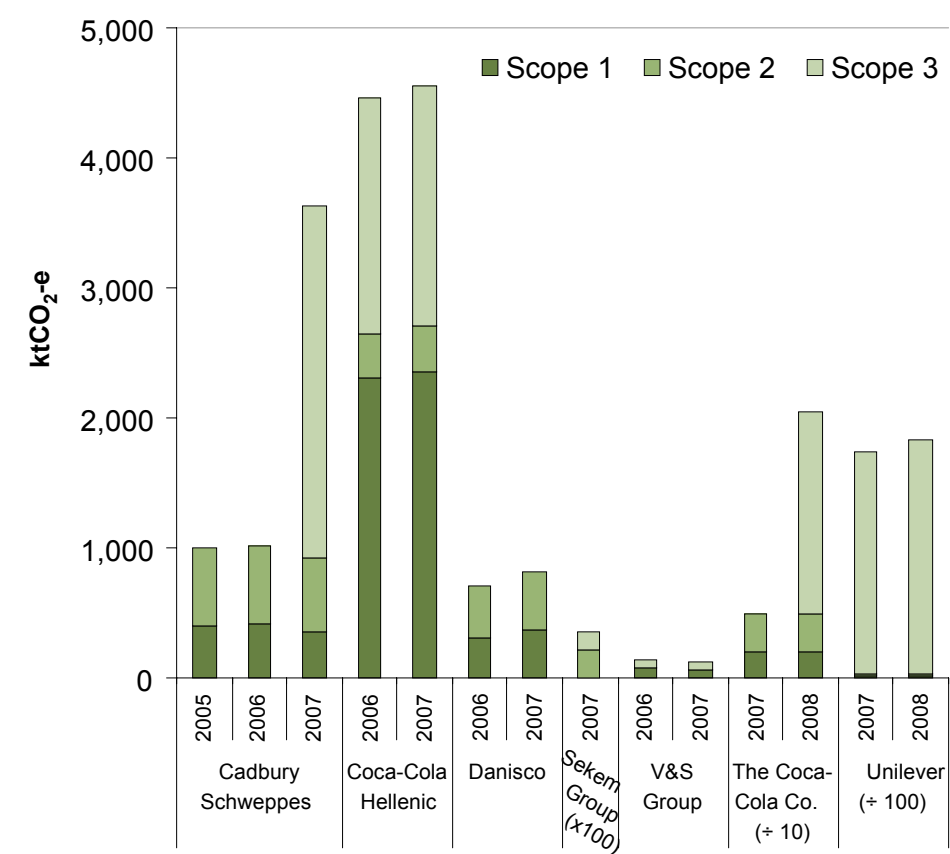
Company and Unilever, have invested in CDM projects and voluntary emissions reductions (see the table below).

Table 28: Food and Beverage firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

Firm	EUETS	CDM/JI	Other
Cadbury	Yes	In the process of developing its offsetting strategy and anticipate initially being net sellers of carbon credits generated either through the regulated flexible mechanisms of Kyoto or through voluntary markets.	They will only consider buying credits from projects that meet either the CDM criteria or the Voluntary gold standard in order to ensure broader sustainability benefits.
Coca-Cola Company	Yes	Developing projects in both China and Brazil that are expected to generate Clean Development Mechanism (CDM) credits.	Not currently participating in Chicago Climate Exchange (CCX) but has had limited involvement in voluntary carbon credit transactions.
Unilever	Yes	Participate in CDM projects where such activities are commercially viable. One site in India is currently registered as a CDM project.	No involvement

- Scope coverage:

Figure 7: GHG emissions by Scope in the Food and Beverage Sector (note Unilever’s emissions are scaled down by a factor of 100 and Coca-Cola’s by a factor of 10 to fit on the same axis as the other firms)



Scope coverage in this sector demonstrates the impact of including Scope 3 emissions in the overall assessment in a sector producing consumer goods, where supply, distribution, and consumer end-use can dominate overall emissions. This is clear from several time series in the above table in which companies begin reporting Scope 3. For example, in 2007, Cadbury Schweppes reported Scope

3 for the first time and it exceeded Scope 1 and 2 emissions combined by a factor of three, accounting for 74% of total emissions. The Coca-Cola Company followed the same pattern. Unilever estimates an even larger contribution from Scope 3: approximately 98% of total emissions.

HEALTH

Sector overview

- Firms participating in C4C:
 - Akzo Nobel NV
 - Essilor International
 - Groupe Bial
 - Novartis International AG
 - Novo Nordisk
 - Novozymes
 - NTUC Healthcare Co-operative
 - Pfizer Inc.
 - SingHealth Group
- Number of firms analyzed in this report: 6 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 84%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 67%
- Firms showing a reduction in absolute emissions during reporting period¹³: 2 out of 6 firms

In the Health sector, four firms report short time series data (2006-7). Of these, Akzo Nobel and Pfizer report reductions in total emissions. Akzo Nobel’s reductions are substantial. They report a 38% drop in total emissions almost entirely as a result of a 75% drop in Scope 1 emissions, which arose because of a change in emissions accounting

as explained in their CDP6 submission:

Until January 1, 2007 CO2 emissions were reported including the emissions of our non- consolidated joint venture cogeneration plants. As of 2007 we have taken these plants out of the scope of our environmental accounting to be in line with our financial reporting¹⁴.

Thus, a substantial part of Akzo’s emissions are simply left “off the books” and the change between 2006 and 2007 should not be interpreted as a reduction in emissions. Similarly, Pfizer writes:

In 2007 Pfizer achieved an absolute energy reduction of approximately or 11% and a GHG emissions reduction of 10% (equivalent to 220,000 tCO2e) over the previous reporting period. Although a large portion of the reduction can be attributed to decreases in production levels at several facilities and facility consolidations, implementation of energy conservation projects and initiatives also led to significant energy consumption and GHG emission reductions.¹⁵

- Emissions intensity:
 - Percentage of firms reporting intensity: 67%
 - Sectoral Definition(s):

13 The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.
14 See Akzo Nobel’s CDP6 submission, response to question 2(f).
15 See Pfizer’s CDP6 submission, response to question 2(f).

Table 29: Emissions intensities reported in the Health sector

Firm	Intensity measure	Most recent value reported
Akzo Nobel	tCO2-e per ton output	0.26
Novartis	tCO2e per TJ, both for Scope1 and on-site energy, as well as for Scope 2 and purchased energy, as a metric for GHG emission intensity	56 (on-site) 91 (off-site)
Novo Nordisk	tCO2 emissions per sales	0.000028
Novozymes A/S	tCO2-e per turnover.	Not reported
Pfizer Inc.	mtCO2 per million dollars of revenue	35

Table 30: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Novartis	15.4	23.2
Novozymes A/S	0.0000342	0.000209
Pfizer Inc.	22	23

- Percentage of firms showing a reduction in emissions intensity: 16%
Only one firm, Novartis, reports more than one year of intensity data. They note a small improvement in on-site energy-related emissions intensity from 2006 to 2007 (58 to 56 tCO2e per TJ). In addition, though Pfizer does not report specific data further back than 2006, they note in their discussion that the achieved a 35% reduction in GHG emissions as indexed to revenue in their response to CDP6 question 3(b).
- Percentage of firms setting targets: 84%

Table 31: Emission reduction or intensity targets described in COPs or CDP submissions in the Health Sector

Akzo Nobel	Target is not yet publicly disclosed
Novartis	<ul style="list-style-type: none">• Reduce on-site Scope 1 GHG emissions by 5% from 2008 to 2012, based on 1990 levels. This target is based on on-site Scope 1 GHG emissions (from combustion and processes), without vehicles.• A separate target was set for the reduction of CO2 emissions from the vehicles fleet by 10% by 2010 (baseline 2005).• No target has been set for Scope 2 GHG emissions.• Additional targets are set on energy efficiency (i.e. 10% by 2010 versus 2006) and contact water efficiency (i.e. 10% by 2010 versus 2005).
Novo Nordisk	Novo Nordisk emission reduction strategy is defined by its participation in the WWF Climate Savers programme. Novo Nordisk has pledged to reduce its CO2 emissions by 10% below 2004 levels by 2014 (an absolute reduction). The time frame for reaching the target is 8 years. The reductions will be achieved through a mix of energy efficiency and renewable energy projects carried out at Novo Nordisk operations globally, including green electricity from 100 % new sources in Denmark.
Novozymes A/S	One of the 2008-targets is to limit the increase in energy consumption to a maximum of 1% less than realized sales growth in local currencies.
Pfizer Inc.	From 2000 to 2007, Pfizer had an emissions intensity target of a 35% reduction in GHG emissions per 106 \$US, which was achieved. They have now set new goals: <ul style="list-style-type: none">• To reduce worldwide CO2 emissions on an absolute basis by 20% from 2008 to 2012 (baseline year 2007).• Meet 35% of Pfizer’s electricity needs by 2010 through the use of “clean” energy technologies. Clean energy sources are defined as wind, solar, biomass, hydro, and cogeneration.

- Experience with emissions trading and offsets:

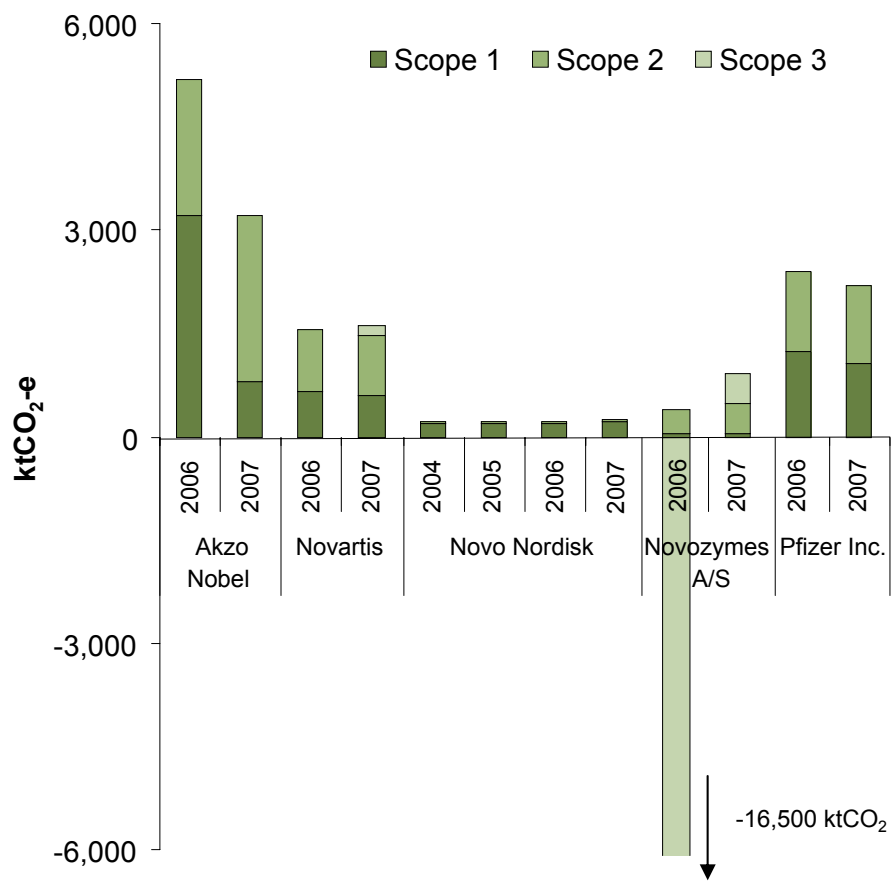
Table 32: Health Sector firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

Firm	EUETS	CDM/JI	Other
Akzo Nobel		Akzo Nobel considers CDM and JI as normal financial tools, but there is no current investment in these type of projects.	
Novartis	Yes	Novartis has two CDM projects in the pipeline: afforestation of pasture land in Latin America (with FSC Certification) and a jatropha plantation in Africa)	
Novo Nordisk	Yes		
Novozymes A/S	Yes	Currently working on a pilot CDM project in partnerships with customers to utilize emission reduction potentials of enzyme technology.	
Pfizer Inc.	Yes	Exploring the feasibility of CDM projects in the event they want to explore future opportunities.	Active in US state of Connecticut's voluntary market. Also completed a review and evaluation of the Climate Leaders, US Climate Action Partnership (USCAP), the CCX, the California Climate Registry and the DOE 1605B Program to determine the best way to position the firm with regard to early action credits.

- Scope coverage:
Six firms report emissions disaggregated by Scope. Like Bayer in the Chemicals sector, Novozymes reports large negative emissions from Scope 3, claiming:
Novozymes’ application of product Life Cycle Assessments (LCA) has made it possible to estimate GHG emissions from suppliers and emission reductions resulting from our customers applications of Novozymes’

products. Activities of Novozymes raw material suppliers result in a 490,000 tCO2 emission...customers’ application of our products reduces CO2 emissions by 17,000,000 t (from CDP5).
Interestingly, in CDP6 they make a similar claim in a side note, but do not enter negative emissions as numerical data. This sector’s Emissions by Scope are shown in Figure 8 below.

Figure 8: GHG emissions by Scope in the Health Sector



INDUSTRIAL GOODS & SERVICES

Sector overview

- Firms participating in C4C:
 - AG2R LA MONDIALE
 - Abengoa
 - Air India
 - Airbus SAS
 - Aktiebolaget SKF
 - Alcan Inc.
 - Aramex PJSC
 - Capgemini
 - Central Warehousing Corporation
 - China International Marine Containers Ltd.
 - China Mobile
 - COSCO (China Ocean Shipping Company)
 - Det Norske Veritas
 - EADS France
 - EADS N.V.
 - Ferrocarrils de La Generalitat de Catalunya
 - Japan Airlines
 - Linde Group
 - Manpower
 - Primex
 - RICOH CO. LTD
 - Samjong KPMG Inc.
 - Scott Wilson Holdings Ltd.

- Sedus Stoll AG
- Talal Abu-Ghazaleh & Co. International
- Teckwah Industrial Corporation Ltd
- Thales
- TNT N.V.
- Veolia Environnement

- Number of firms analyzed in this report: 21 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 67%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 24%
- Firms showing a reduction in absolute emissions during reporting period¹⁶: 2 out of 21 firms

Nine firms in this sector report more than one year of data. Of these, only two report a decrease in emissions: JAL and Ricoh. Data are shown in the table below.

¹⁶ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 33: Total emissions (ktCO2-e) from firms reporting more than one year of data in the Industrials sector

Year	Aktiebo- laget SKF	Alcan	China Mobile	COSCO Pacific	JAL	Ricoh Co.	Thales	Linde Group	Veolia Envi- ronnement
2001		20,600							
2002		20,200							
2003		20,400							
2004		39,600							
2005		31,700							
2006	573	31,900	6,000	12,689	15,791	4,864	278	13,420	39,588
2007	560		7,000	13,717	15,020	1,722	377	14,740	42,802

- Emissions intensity:
 - Percentage of firms reporting intensity: 29%
 - Sectoral Definition(s):
The breadth of activities in this sector means that there are many possible ways

to report emissions intensity and specific comparisons between signatories will be difficult. However, only two out of 14 firms reported an intensity: Thales and TNT. These are reported below:

Table 34: Emissions intensities reported in the Financial Services sector (from CDP 5 and 6)

Firm	Intensity measure	Most recent value reported
Alcan	Alcan offers four intensity indicators: <ul style="list-style-type: none">• PFC Emissions (tCO2-e per ton of hot metal produced);• GHG Emissions from Aluminum Production (tCO2-e per ton of hot metal produced);• Energy Consumption (In kWh/kg aluminum)• Emissions per monetary unit of sales tCO2-e/\$1000 in sales).	1.56 (2005)
COSCO	kg CO2 per 1,000 ton-sea mile	16.05
DNV	kgCO2 per employee	2,080
Japan Airlines Corporation	CO2 emissions per ATK*	Not reported
Ricoh	Scope 1 & 2 emissions (t CO2) per million USD in turnover	16.2
Thales	t CO2-e per square meter of office space	0.154
TNT	ktCO2/ 1000 € in revenue	0.17
Veolia Environnement	“Carbon efficiency ratio” [global reductions of GHG emissions/Total (Scope 1 + Scope 2) GHG emis-sions]. This is calculated by adding together the contribution to GHG emissions of each division (tCO2-e per tCO2-e).	0.58
* Available Ton-Kilometer - an indicator of available air traffic volume that combines the total available tonnage in each sector multiplied by the distance of the sector.		

In addition, three out of 17 firms report emissions intensities on a revenue-basis in their submissions to CDP6 (given in the table below). These vary widely as the three firms are active in unrelated industrial sectors. Veolia Environnement, which is by far the highest emitter by this intensity metric, is

active in multiple utility sectors (water, waste management, energy and transportation), although C4C places them in the “Industrials” sector. As might be expected, their revenue-based intensity matches those reported below in the “Industrials” sector.

Table 35: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Ricoh Co.	7	9.2
TNT	54.2	11.2
Veolia Environnement	822	69

◦ Percentage of firms showing a reduction in intensity: 10%
Only two firms report more than one year of intensity data: Alcan and COSCO. Both report improvements in emissions intensity. Alcan reports a time series running from 2001-2005, during which they improved emissions per 1000 USD in sales

by 5% (from 1.64 to 1.56 tCO2-e per \$1000 in sales). COSCO, a shipping company, reports intensity in terms of emissions per 1000-ton-mile and discloses data for 2003 and 2007. These data show a 5% reduction, from 24.8 to 16.1.

- Percentage of firms setting targets: 28%

Table 36: Emission reduction or intensity targets described in COPs or CDP submissions in the Industrial Goods and Services sector

JAL	20% fuel reduction, 10% thermal/electric consumption with 1990 as baseline
Ricoh	35% reduction from 1990 in emission intensity (CDP6)
Thales	10% reduction of energy use and 10% reduction of CO2e per business traveler (baseline year unclear).
TNT	6% reduction in company car emissions by 2011, 20% emissions reductions from business travel by air
Veolia Environnement	Carbon eco-efficient ratio target of 23% by the year 2011

- Experience with emissions trading and offsets:
How many facilities fall under the EUETS?

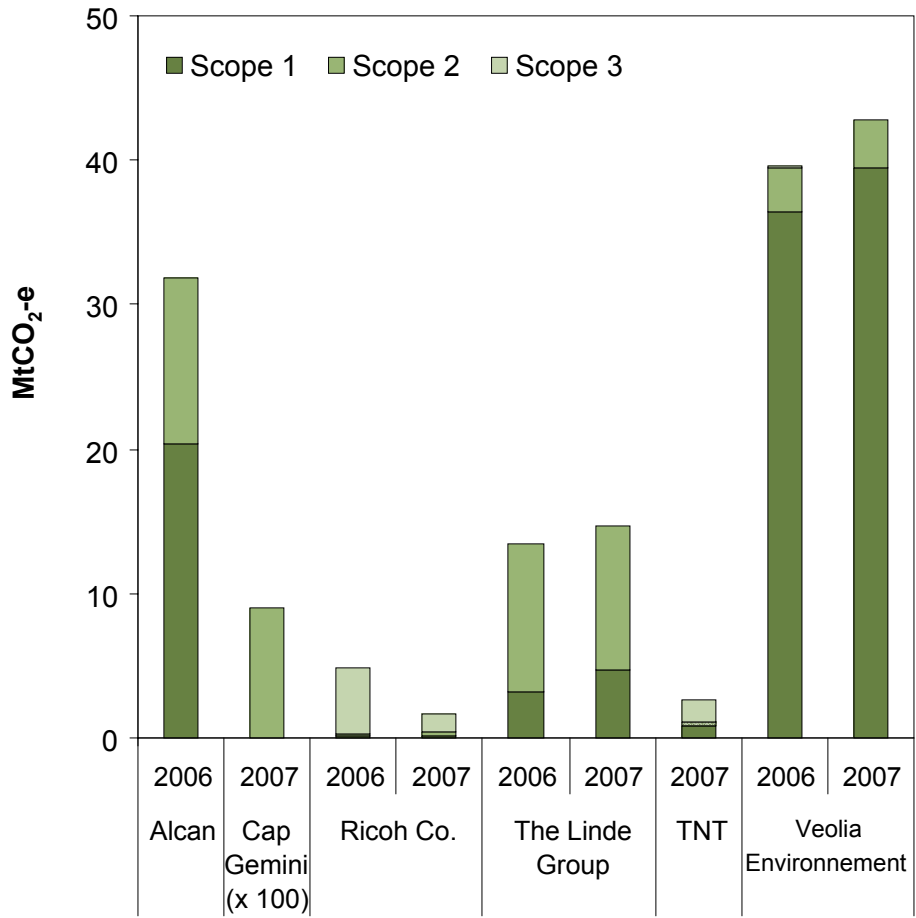
Table 37: Industrial firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

Firm	EUETS	CDM/JI	Other
SKF	Yes, company has facilities covered	Voluntarily engages in CDM through employees offsetting program	
Ricoh Co.		Preparing CDM credit	
TNT			Compensate business air travel and company cars in the Netherlands with dedicated CO2 reduction projects in India from the Climate Neutral Group. The verified emission reductions (VERs) generated by these projects will be traded exclusively to TNT. Customers can also voluntarily calculate CO2 emissions of shipments using an online calculator.
Veolia Environnement	Yes	The firm is involved in numerous JI and CDM projects In addition, Veolia Environmental Services is active in project development, with four registered CDM projects and 10 others in the pipeline.	In 2007, Veolia Environmental Services North America Corp. (VESNA), a US subsidiary joined the CCX and committed to reduce its emissions 6% by 2010 (average 1998-2001 baseline).

• Scope coverage:
Six firms in this sector report emissions disaggregated by Scope 1 and 2. Two of these also report Scope 3 emissions. This sector includes a wide range of business activities (e.g. manufacturers, air transport firms, and consultants). As a result, the contribution

of each Scope varies considerably. Those that do report Scope 3 (Ricoh and TNT), that Scope is the majority of emissions. For Ricoh, the bulk of Scope 3 emissions arise as a result of consumer end-use and supply chain. For TNT, they arise as a result of distribution and logistics.

Figure 9: GHG emissions by Scope in the Industrial Sector



MEDIA

These firms are included as the only representatives of the media sector although no information was available for either.

- Firms participating in C4C:
 - MediaCorp
 - MCI Communication Spain, S.A.
- Number of firms analyzed in this report: 2 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 0%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 0%

- Firms showing a reduction in absolute emissions during reporting period¹⁷: 0%
- Emissions intensity:
 - Percentage of firms reporting intensity: 0%
 - Sectoral Definition(s): None available.
 - Percentage of firms showing a reduction in emissions intensity: 0%
- Percentage of firms setting targets: 0%
- Experience with emissions trading and offsets: none
- Scope coverage: none available

¹⁷ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.



OIL AND GAS

Sector overview

- Firms participating in C4C:
 - Attock Refinery Limited
 - Centrica plc
 - Copagaz Distribuidora de Gas Ltda- Grupo Zahran
 - Empresa Nacional del Petróleo
 - ENI
 - Oil and Natural Gas Corporation Ltd.
 - OMV Aktiengesellschaft
 - Repsol YPF
 - StatoilHydro
 - Number of firms analyzed in this report: 9 (percentages below refer to this number)
 - Percentage of firms reporting at least one critical data point between 2005 and 2008: 78%
 - Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 56%
 - Firms showing a reduction in absolute emissions during reporting period¹⁸: None
- No firms show a systematic reduction in the reporting period. However, firms in

the oil and gas sector are commendable for relatively thorough coverage of emissions data. 6 out of 9 firms report absolute emissions for at least one year and 5 out of nine report more than one year. In addition, many firms began reporting Scope 3 emissions in 2008 (see below for more detail on disaggregation by Scope 1, 2, and 3 in this sector).

- Emissions intensity:
 - Percentage of firms reporting intensity: 56% (5 out of 9)
 - Sectoral Definition(s): firms in the oil and gas sector cited difficulty in settling on a single metric to define emissions intensity. The difficulty arises in part, because the firms are often involved with multiple upstream and downstream operations: exploration and extraction, refining, and power generation. The table below describes the metrics used.

¹⁸ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 38: Emissions intensities reported in the Oil and Gas sector

Firm	Intensity measure	Most recent value reported
Centrica	g CO2/kWh of power generated	390
ENI	Each division and company identifies its specific Key Performance Indicators, based on different metrics: <ul style="list-style-type: none">• Exploration & Production: tCO2-e per Ktoe oil/ gas production• Power Generation: tCO2-e per MWhe + t• Refining: tCO2-e per ton of oil refined	565
OMV Aktiengesellschaft	Tons of CO2-e per ton output	0.357
Repsol YPF	In the case of the oil and gas industry, it is important to establish a clear distinction between the way the Downstream and Upstream Divisions report their CO2 emissions, considering the diversity of the operations. <ul style="list-style-type: none">• Downstream: t CO2-e/ t crude oil treated• Upstream: t CO2-e/mboe	45.59 (upstream) 0.259 (downstream)
StatoilHydro	kg CO2 per unit produced (a standard cubic meter oil equivalent or ton). In refining they use per unit processed, in accordance with industry practice.	0.058

In addition, five of the firms in this sector are participants in CDP, and have reported intensities based on revenue and disaggregated by from Scope 1 and Scope 2 as requested

in CDP6 question 3(b)ii. These data are fairly consistent across firms with the exception of Repsol, which is a clear outlier for reasons that are not clear.

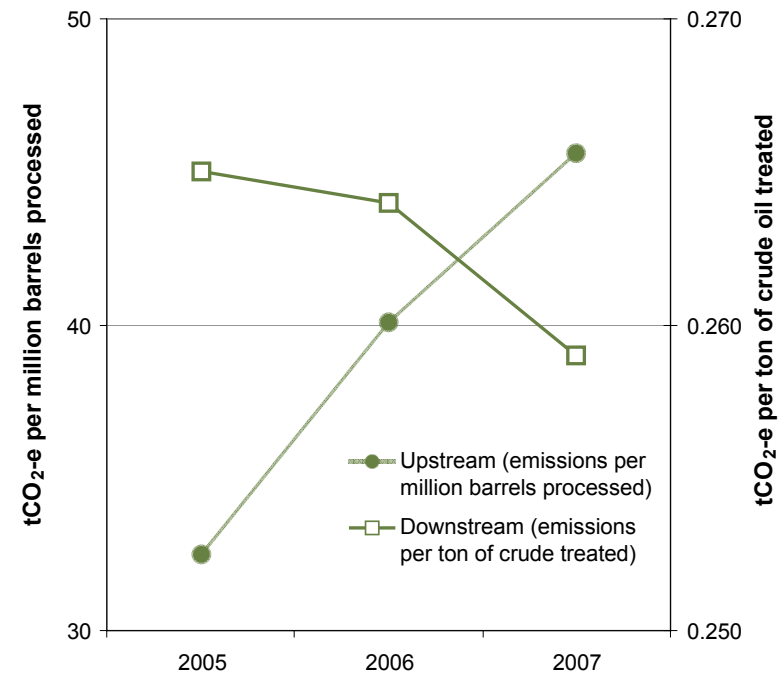
Table 39: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
ENI	565	34
Repsol YPF	0.33	2.2E-05
StatoilHydro	171	3.5
Centrica	292	3.74
OMV	442	Not reported

- Percentage of firms showing a reduction in emissions intensity: 11%
- Five firms report intensity. Two of these, Centrica PLC and Repsol YPF, disclosed more than one year of data (see question CDP 3(b) for each). Centrica shows a reduction of 5% between 2005 and 2007 (only

accounting for UK power production). The data that Repsol reports is ambiguous: their downstream intensity shows an improving 3-year trend while their upstream intensity follows an increasing trend. This is shown in the figure below.

Figure 10: Repsol's upstream and downstream intensity metrics showing conflicting results



- Percentage of firms setting targets: 57%

Table 40: Emission reduction or intensity targets described in COPs or CDP submissions in the Oil and Gas Sector

Centrica plc	Reduce UK power generation carbon intensity to 380g CO2/kWh by 2012. Aim to go further by cutting intensity to 350g CO2/kWh by 2020 and investing £1.5bn in renewable energy assets over the next five years
ENI	To curb its GHG emissions, ENI is implementing several reduction projects (total investment of €1.5 billion from 2008-2011). This aims primarily at reduction of gas flaring in operated countries.
OMV Aktiengesellschaft	Specific investments with a high impact on GHG emission reductions are: <ul style="list-style-type: none">• Modernization of facilities in Petrom, especially in the refineries and in the E&P infrastructure all across Romania with a total investment of 3 billion Euro until 2010• Funding of research and pilot projects by the OMV Future Energy Fund, founded with start-up capital of 100 million Euro to enable total investments of around EUR 500 million Euro in the fields of renewable energy sources, other energy technologies and applications that reduce environmental impact caused by greenhouse gases (e.g. CCS, ZEP) and energy-saving technologies.
Repsol YPF	Repsol YPF is deploying an integrated Carbon Management Plan formulated in 2003, further developed in 2004 and is revised yearly. It is focused on three main action lines: reducing emissions, acting in the carbon market and emissions verifications and inventories.
StatoilHydro ASA	Reducing emissions are closely linked to overall process design and development and they do not do separate accounting for CO2 emission reduction activities.

- Experience with emissions trading and offsets:
At least four of the firms in this sector have facilities that fall under the EUETS.

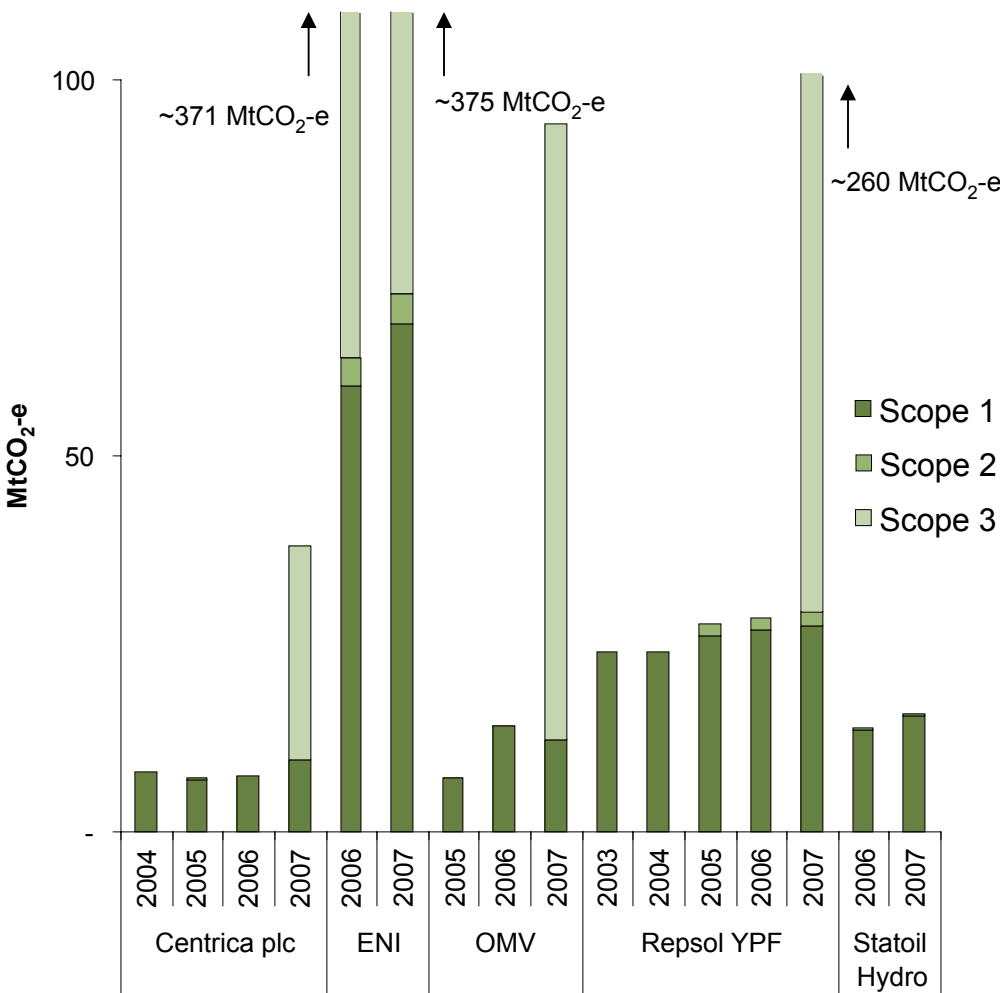
Each of these firms also participates in CDM/JI markets. Details are provided in the table below.

Table 41: Oil and Gas firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity)

Firm	EUETS	CDM/JI	Other
Centrica	Company has facilities covered by the EU ETS	Active in CDM and JI markets. Invested in numerous projects across the globe.	Investing in Climate Change Capital's second Carbon Fund which is widely considered as the world's largest private carbon fund.
ENI	Company has facilities covered by the EU ETS	Developing a portfolio of reduction projects in CDM and JI.	
OMV	Company has facilities covered by the EU ETS	Several projects (and project ideas) are currently under internal analysis and discussion, at different stages of the CDM or JI project cycle. For such projects, an internal threshold for GHG reduction potentials has been set in order to manage the administrative burden associated with the corresponding procedures.	
Repsol YPF	Company has facilities covered by the EU ETS	Promoting economic incentive for the development of CDM/JI projects. Climate Change Unit is working closely with business units to identify emissions reductions opportunities with CDM potential and manage the projects throughout the CDM process.	An analysis of voluntary markets was conducted to decide whether the company should involve itself in voluntary GHG reductions measures (both as a purchaser and producer of voluntary reductions). No conclusive result was reached in 2007 due to the immaturity of the voluntary market.

- Scope coverage:
Five firms in this sector report emissions disaggregated by Scope 1 and 2. Four of these also report Scope 3 emissions, though only in more recent years. Scope 3 is particularly crucial in this sector. Firms extract fossil fuels that are later combusted by consumers. As a result, when end-use is considered, it contributes to 75-89% of firms' total emissions. The figure below shows the scale of emissions from each Scope.

Figure 11: GHG emissions by Scope in the Oil and Gas Sector



PERSONAL & HOUSEHOLD GOODS
Sector overview

- Firms participating in C4C:
 - Dudalina S.A.
 - Esquel Group
 - Haier Group
 - Lego
 - L’Oreal
 - LVMH
 - Narai Intertrade Co, Ltd
 - Pranda Jewelry Public Company Ltd
 - Sabaf SpA
 - Sing Lun Holdings
 - V. Mane Fils S.A.
 - Yuhan-Kimberly
- Number of firms analyzed in this report: 12 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 33%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 8%
- Firms showing a reduction in absolute emissions during reporting period¹⁹: 1 out of 12 firms

Three out of twelve firms reported time series of absolute emissions data in this sector.

Only one firm, L’Oreal, reported a systematic decrease in emissions (5% between 2005 and 2008). Another firm, Sabaf S.p.A. of Italy, reported erratic emissions that first increased by 300% from 2004-2006, and then decreased by 60% the following year, so that over a 4 year span, the firm claims to have increased emissions by 69%. Their COPs offer no insight into this volatility, so it is not clear if this is incorrect accounting or reflects their actual emissions.

- Emissions intensity:
 - Percentage of firms reporting intensity: In this sector, only one firm, L’Oreal, reports intensity.
 - Sectoral Definition(s): only one C4C signatory in this sector, L’Oreal, defines an intensity. To get an understanding of how other actors in this sector define it, we examined submissions from CDP participants not active in C4C. There are ten participants in this sector and they utilize various metrics for emissions intensity. These are outlined below with L’Oreal:

¹⁹ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 42: Emissions intensities reported in the Personal and Household Goods sector from CDP participants that are not signatories to C4C.

Firm	Intensity measure
Beiersdorf AG	Tons of CO2-e per product unit
Colgate Palmolive Company	kg of CO2 per ton of product
Henkel KGaA	Tons of CO2per ton of product
Kimberly-Clark Corporation	Tons of CO2-e per ton of production kg CO2 per US\$ sales (not CO2-e)
L’Oreal	For their industrial operations, we are using metric grams of CO2 per finished product produced or handled (factories and warehouses). In their non-manufacturing and non-logistics sites, we will use a measure like metric tons per 100 square meters of space.
Natura Cosméticos S.A.	kg of CO2-e per kg of product
Oriflame Cosmetics AB	Tons of CO2 per million units produced Tons of CO2 per ton bulk produced Oriflame is also measuring emissions per employee as a preliminary intensity measure while investigation of the most relevant intensity measure is underway.
Reckitt Benckiser	Ton of CO2-e per Consumer Unit (a Consumer Unit (CU) is the normal unit of product purchased by the consumer i.e. a single box, bag, bottle, etc)
Uni-Charm Corporation	Tons of CO2-e per unit sales (¥)

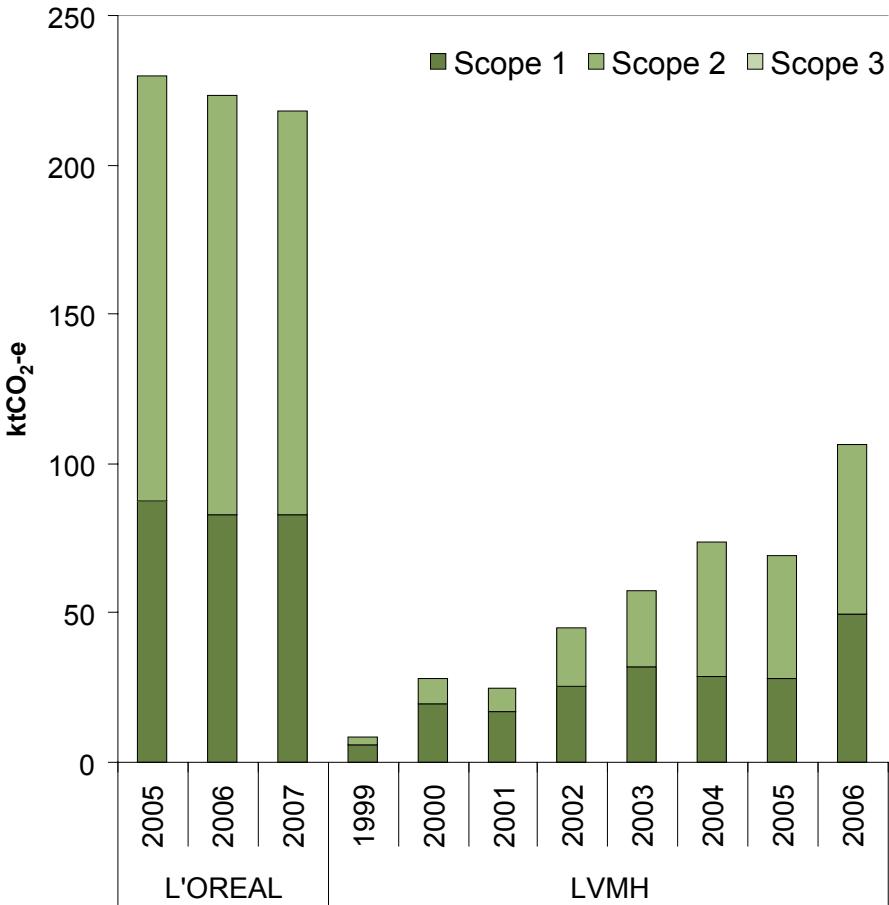
- Percentage of firms showing a reduction in emissions intensity: None
No time series data is available for emission intensities.
- Percentage of firms setting targets: 8%
- They plan to continue reducing Scope 1 and 2 emissions, although they do not specify a specific quantity in CDP6. Moreover, they have a 20% travel reduction plan in place to try to address Scope 3 emissions.

It appears only L’Oreal has set specific emissions reduction targets:

Past targets:

- The firm set a goal of reducing Scope 1 emissions by 2% from 2005 levels and they achieved a reduction of 5.5% by 2007. In the same period they also achieved a reduction of 5% in both Scope 1 and 2 emissions combined.
- In 2007, they established an additional 1-year goal to reduce energy use by 5% per finished product and an absolute reduction in GHG emissions of 2%.
- Experience with emissions trading and offsets:
None of the firms in the sector appear to be active in emissions trading; however, Sabaf SpA notes that they purchased RECs to offset 20 GWh, over 80% of their electricity consumption in 2007 (2008 COP).
- Scope coverage:
Two firms in this sector report emissions disaggregated by Scope 1 and 2. Neither of these report Scope 3 emissions. The time series evolution for each firm is shown below.

Figure 12: GHG emissions by Scope in the Personal and Household Goods Sector



REAL ESTATE

Sector overview

- Firms participating in C4C:
 - City Developments Ltd
 - Korea Land Corporation
- Number of firms analyzed in this report: 2 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 100%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 0%

- Firms showing a reduction in absolute emissions during reporting period²⁰: 0%
- Emissions intensity:
 - Percentage of firms reporting intensity: Neither firm reports an emissions intensity although City Developments Ltd reports data for an energy intensity and suggests an emissions intensity metric (see below).
 - Sectoral Definition(s):

20 The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 43: Emissions intensities reported in the Real Estate sector

Firm	Intensity measure	Most recent value reported
City Developments Ltd	tCO2-e per m2 of new construction	Not reported
	kWh per m2 of new construction	55
	monthly kWh per m2 in commercial properties	18,856
	monthly kWh per m2 in industrial properties	10,443

- Percentage of firms showing a reduction in emissions intensity: none
Neither firm reports data for emissions intensity. However, City Developments reports several energy intensity measures, as shown in the table above. The latter two have improved significantly between 2005 and 2007.
- Percentage of firms setting targets: 50%
City Developments reports a target of 5% reduction in electricity consumption but sets no targets for absolute or relative emissions.

- Experience with emissions trading and offsets: neither firms uses offsets
- Scope coverage:
Neither firm reports emissions by Scope. City Developments only reports Scope 2 data (electric power consumption) both for its new construction and for its occupied properties.

RETAIL

Sector overview

- Firms participating in C4C:
 - Auchan France
 - El Corte Ingls, S.A.
 - ICA AB
 - IKEA Group
 - Li and Fung Limited
 - Lindex
 - Groupe La Poste
 - Groupe ONE
- Number of firms analyzed in this report: 5 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 80%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: One out of five firms analyzed (Lindex).
- Firms showing a reduction in absolute emissions during reporting period²¹: 40%
Two firms of the five analyzed report reduc-

- tions in emissions: Auchan and Lindex. Auchan only reports emissions “caused by road transport associated with Auchan’s activity”²²
- Emissions intensity:
 - Percentage of firms reporting intensity: 40%
Ikea reports intensity as emissions per unit volume of goods produced (gCO2/m3). Auchan reports an intensity linked to its transport emissions. Otherwise, no firms appear to define or report intensity data. Ikea reports a reduction of 21% in their intensity, despite an overall gain in emissions (2007 CSR report).
 - Percentage of firms setting targets: 60%

21 The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.
22 Translated from the 2008 COP (see http://www.unglobalcompact.org/data/ungc_cops_resources/8856F139-7C8A-43FD-B6F4-8B4320FE-46BC/COP.pdf, p. 4).

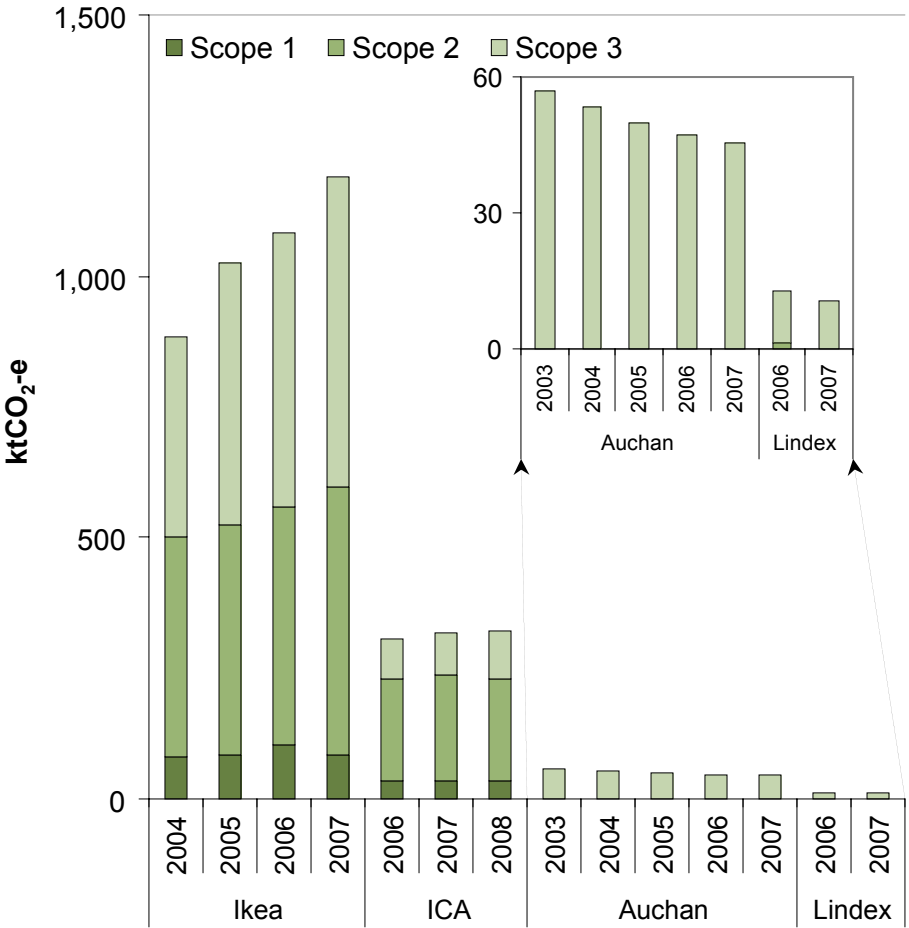
Table 44: Emission reduction or intensity targets described in COPs or CDP submissions in the Retail Sector

Li & Fung Limited	5% reduction in electricity use by March 2009 (no baseline specified)
Ikea	<ul style="list-style-type: none">• Improve overall energy efficiency by 25 percent compared to 2005 (all stores, distribution centers, factories and offices)• Supply 100% renewable energy (no date specified)• Reduce CO2 emissions 12% percent by 2010 (already achieved)
Lindex	Numerous country level electricity and transportation goals (see 2007 CSR report)

- Experience with emissions trading and offsets:
There is no activity apparent in emissions trading or in the use of offsets.
- Scope coverage:
Two firms, ICA and Ikea, report their emissions disaggregated by Scope 1, 2, and

3. Lindex reports Scope 2 and 3, but no elements of Scope 1. In its 2008 COP, Auchan reports steadily decreasing transportation emissions,, which constitute an element of Scope 3 (supply chain and product distribution), but the firm does not report any other aspects of its emissions profile.

Figure 13: GHG emissions by Scope in the Retail Sector



TECHNOLOGY

Sector overview

- Firms participating in C4C:
 - ABB Ltd.
 - Areva
 - Broad Air Conditioning
 - Cisco Systems
 - Consort NT
 - Danfoss Group
 - Fuji Xerox Company Ltd.
 - Infosys
 - Royale Philips Electronics
 - SAP
 - Seiko Epson Corp
 - Telvent
- Number of firms analyzed in this report: 11 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 64%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 45%

- Firms showing a reduction in absolute emissions during reporting period²³: 2 out of 11 firms

In this sector, eight firms reported more than one year of data. Of these, only ABB and Areva showed an absolute decrease; however, those firms only report data from 2006 and 2007, so neither decrease should be considered a long-term trend. Seiko-Epson also showed a decrease from 2006-7, but their 2007 emissions still exceed emissions in 2004, the earliest year they report, by 16%. The multi-year data for this sector is shown in the table below.

²³ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 45: Absolute emissions in the Technology sector

Year	ABB	Areva CI	Cisco Systems	Fuji Xerox	Infosys*	Philips Electronics	Seiko Epson
2000				77,311			
2001				125,308			
2002				440,171			
2003				324,000			
2004				388,000			782,000
2005				391,400			952,000
2006	1,741,000	1,119,000	530,950	703,200	230,000	2,188,468	1,360,000
2007	1,577,000	1,005,400	750,877		212,000	2,345,720	907,000
* In their CDP6 response, Infosys reports that their total emissions are 212 tCO2-e rather than 212 ktCO2-e. The correct data is found in their 2007-2008 Sustainability Report, but is notably absent from their COP submission.							

Some additional comments are worthwhile. Fuji Xerox experienced a large jump in emissions from 2005-2006, which is attributable to a doubling of Scope 3 emissions, possibly

reflecting a change in Scope 3 methodology. Infosys reported very minimal emissions in 2007 (CDP6) with no explanation.

- Emissions intensity:
 - Percentage of firms reporting intensity: 45%
 - Sectoral Definition(s):
The Technology sector consists of many different types of firms ranging from
- Infosys, a major software company, to Areva, which is active in nuclear power across the entire fuel cycle from uranium mining to plant construction and waste disposal. Thus, there are a wide range of possible intensities reported.

Table 46: Emissions intensities reported in the Technology sector

Firm	Intensity measure	Most recent value reported
ABB	tCO2-e per employee (scope I and scope II)	14
Areva CI	GHG emissions per turnover	Not reported
Cisco Systems, Inc.	Cisco believes normalizing global emissions by sales revenue (turnover) is the most appropriate measure of cost:benefit to society from business activity and is shown below. In addition, they normalize our office and lab electricity use and emissions by floor area and head count for internal management, such as to compare electricity and emissions among different sites, countries or regions.	15.6
Fuji Xerox	“Eco-efficiency”*	0.94 (2006)
Infosys Technologies Ltd	Emissions intensity is not currently reported or measure. They are focusing on energy consumption per employee.	Not reported
Philips Electronics	tCO2-e per 106 € sales	87.6
Seiko Epson	Emissions/unit sales (indexed to 1990 = 100)	0.47
* From 2000-2005, Fuji Xerox used a proprietary measure of “eco-efficiency”, which is defined in terms of sales per environmental impact (CO2 emissions/new resource input) so that higher values are more efficient [less emission intensity]. They use a 2000 base level of 1.0. This was redefined in 2006 to reflect only CO2 emissions, but it is not clear how the new index relates to the old.		

In addition, three firms in this sector reported intensities based on revenue and disaggregated by from Scope 1 and Scope 2 as requested in CDP6 question 3(b)ii. These data

are fairly consistent across firms with the exception of ABB, which reports extremely low figures for reasons that are not clear.

Table 47: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
ABB	0.000029	0.000025
Cisco Systems, Inc.	1.9	13.7
Philips Electronics	13.3	20.7

- Percentage of firms showing a reduction in emissions intensity: 18%
Of the eleven firms analyzed in this sector, only two, Fuji Xerox and Seiko Epson, report time series of intensities. Interestingly, both use indicators that are indexed to a base year, making comparisons with other firms difficult. Both show improvements/. Seiko Epson report 53% improvement in emissions per unit sale
- since 1990. Fuji Xerox also claim improvements, however their metric is based on an opaque eco- efficiency index that is difficult to interpret. Moreover, the metric itself was changed in 2006 with a new set of goals established. It is not clear whether the improvements are genuine.

 - Percentage of firms setting targets: 36%

Table 48: Emission reduction or intensity targets described in COPs or CDP submissions in the Technology Sector

ABB	5% less use of energy per output unit (a rolling target every two years).
Areva CI	The Group had set and achieved the following targets for the end of 2006 <ul style="list-style-type: none">• Reduced energy consumption by 15%• Reducing direct greenhouse gas emissions by 20% Now the Group hopes to achieve these objectives by the end of 2011: <ul style="list-style-type: none">• energy consumption: 20% reduction (2004 baseline)• GHG emissions: 50% reduction (2004 baseline)
Cisco Systems	Reduce global GHG emissions 25% from 2007 to 2012
Fuji Xerox	Increase “eco-efficiency” to 1.3 by 2004 Doubling “eco-efficiency” by 2010 (different metric than was used 2004?)



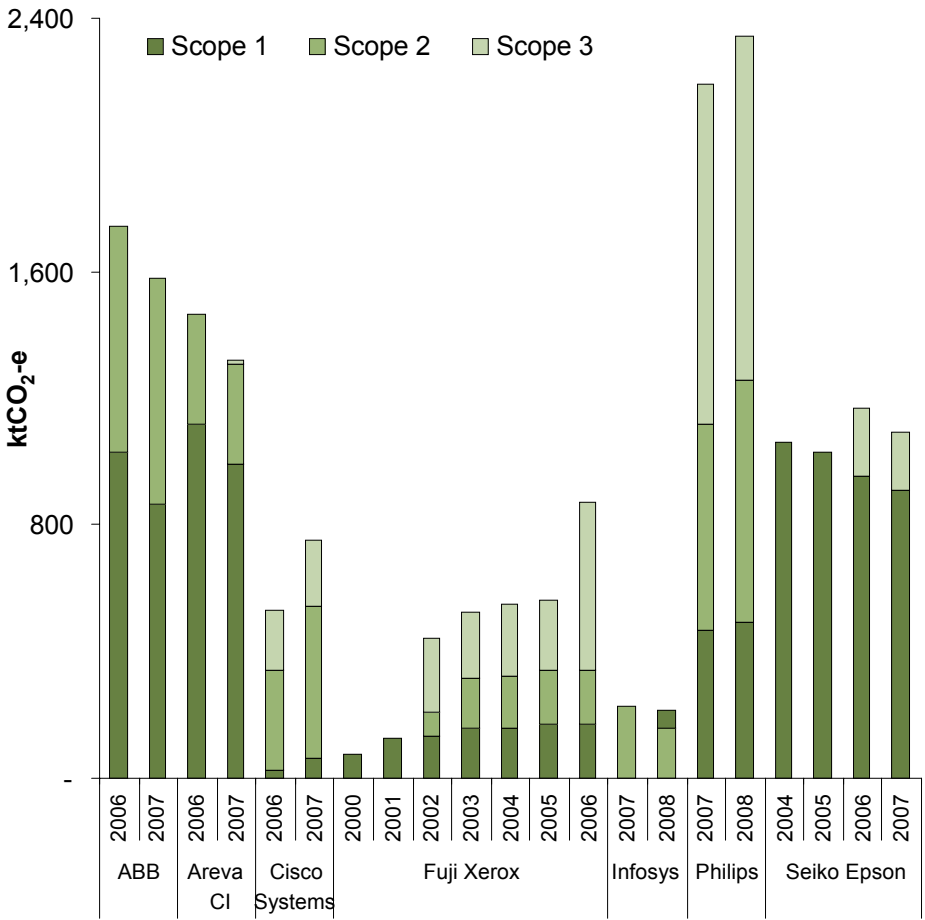
- Experience with emissions trading and offsets:
Two firms in this sector, Areva and Philips, report that they have facilities that fall under the EU-ETS. These same firms report an interest in CDM/JI, though only Philips has gotten directly involved.

Table 49: Technology firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity).

Firm	EUETS	CDM/JI	Other
Areva	Yes, the company has facilities covered by the EU ETS.	Areva did not engage in CDM/ JI in 2007. However, activities in biomass in developing countries have developed in-house expertise in the CDM and they intend to explore these further.	
Infosys			They are now a part of the India Climate Exchange, which has been recently set up. We are not trading at present through any exchange.
Philips Electronics	Yes, their company has facilities covered by the EU ETS.	Philips has several CDM/JI projects underway distributing energy efficient lighting to the underprivileged populations.	

- Scope coverage:
Six firms in this sector report emissions disaggregated in some combination of Scopes 1, 2 or 3. The data is shown in the figure below.

Figure 14: GHG emissions by Scope in the Technology Sector



TELECOMMUNICATIONS

Sector overview

- Number of firms participating in C4C: 8 (1 from non-Annex 1 parties)
 - Alcatel-Lucent
 - Brasil Telecom S.A.
 - Deutsche Telekom
 - Euskaltel S.A.
 - LM Ericsson
 - Singapore Telecom
 - Telecom Italia
 - Telefonica S.A.
- Number of firms analyzed in this report: 6 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 84%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 33%
- Firms showing a reduction in absolute emissions during reporting period²⁴: 1 out of 6 firms

Three firms out of six analyzed in this sector report time series of total emissions: Alcatel-Lucent, Deutsche Telekom, and Telecom Italia. Of these, only one, Deutsche Telekom, reports a decrease. Deutsche Telekom’s reporting goes back to 2004 and their emissions in 2007 reflected a 12% decrease relative to the 2004 baseline. Alcatel-Lucent and Telecom Italia both report increased emissions between 2006 and 2007 of 24% and 12% respectively.

- Emissions intensity:
 - Percentage of firms reporting intensity: 33%Several firms have suggested metrics; however, only Deutsche Telekom and Telecom Italia provide actual numbers. These are shown in the tables below:
 - Sectoral Definition(s):

²⁴ The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 50: Emissions intensities reported in the Telecommunications sector

Firm	Intensity measure	Most recent value reported
Alcatel - Lucent	Presently obtaining data to assess development of emissions intensity targets.	Not reported
Brasil Telecom S/A	Currently developing a methodology to quantify this intensity.	Not reported
Deutsche Telekom AG	tCO2-e per gigabyte (GB) would be the most appropriate measurement of emissions intensity, but it is not currently used for several reasons: <ul style="list-style-type: none">• GB are not the only criteria for measuring the performance of their products and services.• Due to the diversity of products and services, it is difficult to assign detailed emissions factors.	Not reported
Telecom Italia	Telecom Italia S.p.A. uses a Eco-efficiency indicator to monitor energy efficiency based on the quantity of transmitted bits per unit of energy consumption. For this purpose the following inputs are considered: <ul style="list-style-type: none">• voice and traffic data (fixed and mobile)• industrial and corporate energy consumptions The indicator for 2007 shows an approximate 45% increase as compared to 2006 exceeding the defined target of 850 Bit/Joule.	873

In addition, two firms, Deutsche Telekom, and Telecom Italia report intensities based on revenue and disaggregated by from Scope

1 and Scope 2 as requested in CDP6 question 3(b)ii. These data are fairly consistent between the two firms.

Table 51: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
Deutsche Telekom AG	2.28	27.50
Telecom Italia	3.52	22.74

- Percentage of firms showing a reduction in emissions intensity: none of the firms in this sector report time series data for intensities.
- Percentage of firms setting targets: 67%

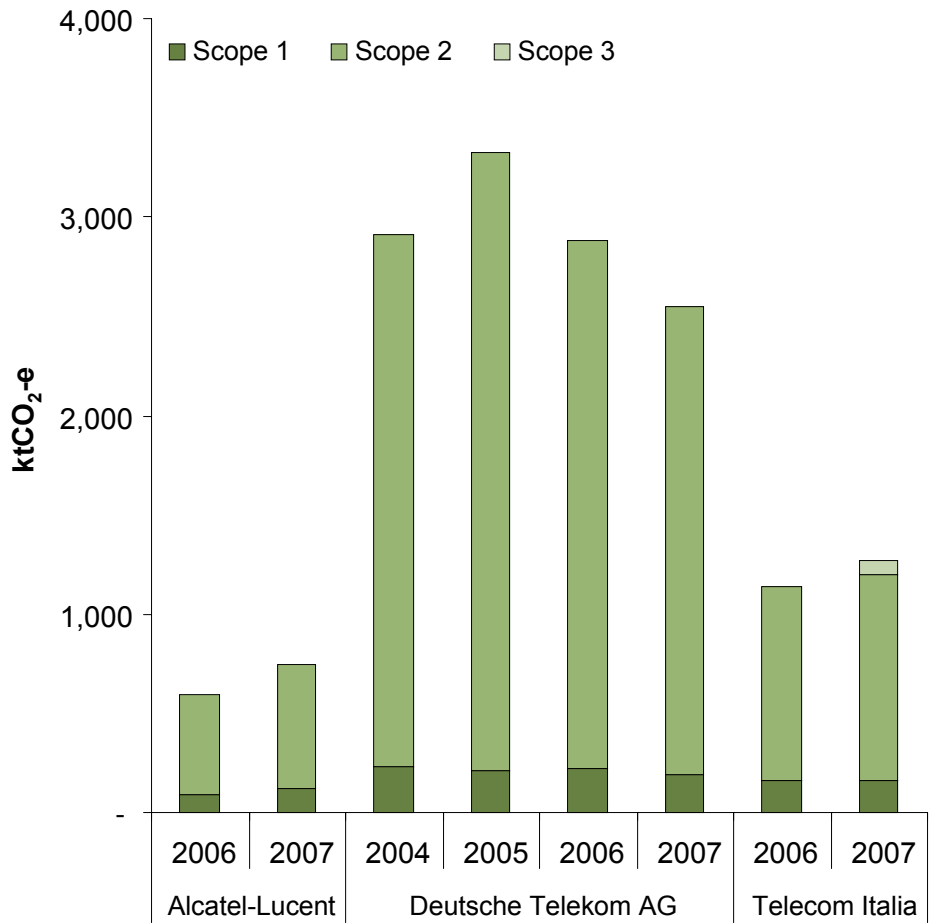
Table 52: Emission reduction or intensity targets described in COPs or CDP submissions in the Telecommunications Sector

Alcatel-Lucent	10% reduction in total GHG emissions from facilities by 2010 based on the 2007 CSR reported baseline.
Brasil Telecom S/A	0.5% (zero point five percent) reduction in CO2 emissions from electricity consumption per client (per-capita consumption) at its head office as well as its branch office in the Federal District.*
Deutsche Telekom AG	Original target: 50% reduction of energy-based CO2 emissions in Germany by 2010 compared with 1995. A 54% reduction was achieved in 2007. New target: 100% all electric power consumption in Germany from renewable sources (German energy mix and RECS) by 2008. <ul style="list-style-type: none">• In 2007 achieved 67.9% renewables• Measures to achieve the target in 2008 have been introduced.
Telecom Italia	For the ecoefficiency indicator, the commitment for 2008 is +30% with respect to 2007 instead of 873 bit/Joule of 2007 we set a 2008 target to 1130 b/J
* It is not clear if Brasil Telecom's target is defined on an annual (rolling) basis or if there is a target year to achieve this reduction.	

- Experience with emissions trading and offsets:
None of the firms in this sector have facilities covered in the EU ETS and none report participation in Kyoto Mechanisms like CDM or JI. One firm, Deutsche Telekom, gives an indication of activity in carbon offset markets, noting activity in an emission trading pilot project called Hesse Tender (CDP6).

- Scope coverage:
Four firms in this sector report emissions disaggregated by Scope 1 and 2. One firm also reports Scope 3 emissions. Among the firms disclosing disaggregate data, Scope 2 is the most prominent source of emissions. Data are shown in the figure below.

Figure 15: GHG emissions by Scope in the Telecommunications Sector



TRAVEL AND LEISURE

- Firms participating in C4C:
 - Singapore Zoological Gardens
 - Banyan Tree Hotels & Resorts Pte Ltd
- Number of firms analyzed in this report: 2 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 50%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 0%
- Firms showing a reduction in absolute emissions during reporting period²⁵: None
Neither firm provides total emissions data.

- Emissions intensity:
 - Percentage of firms reporting intensity: 50%
Banyan Tree is a resort company and reports intensity in terms of energy consumption and GHG emissions per guest night.
 - Sectoral Definition(s): Banyan Tree defines a revenue based intensity.

25 The reporting period varied and ranges from 2002 – 2008. Therefore these data may refer to any time span between two and six years.

Table 53: Emissions intensities reported in the Automobiles & Parts sector

Firm	Intensity measure	Most recent value reported
Banyan Tree Hotels & Resorts	kg CO2-e per guest night	10.3
Pte Ltd	MJ per guest night	904.5

- Percentage of firms showing a reduction in emissions intensity: none
2008 marked the first time that Banyan Tree was reporting GHG emissions so that only one year of data is currently available.
- Percentage of firms setting targets: 50%
Banyan Tree has set a target of reducing carbon emissions by 10% every year from 2006 levels between 2008 and 2010²⁶.

- Experience with emissions trading and offsets: neither firms uses offsets; however Banyan Tree reports that it is active in tree planting campaigns.
- Scope coverage: firms do not provide emissions data

26 Based on Banyan Tree's 2008 CSR report available at <http://www.banyantree.com/downloads/pdf/PressKit/BT%20CSR%20Report%202008.pdf>

UTILITIES

Sector overview

- Number of firms participating in C4C: 13 (4 from non-Annex 1 parties)
 - Agbar.
 - DONG Energy
 - E.ON AG
 - EDF
 - Eskom
 - Gamesa Corporacion Tecnologica S.A.
 - Korea Rail Road
 - Korea South-East Power Co. Ltd.
 - Redes Energeticas Nacionais, S.A.
 - RWE AG
 - Senoko Power
 - Suez
 - Union Fenosa
- Number of firms analyzed in this report: 11 (percentages below refer to this number)
- Percentage of firms reporting at least one critical data point between 2005 and 2008: 100%
- Percentage of firms reporting half or more (6 out of 13) of the critical data points between 2005 and 2008: 36%
- Firms showing a reduction in absolute emissions during reporting period²⁷: 1 out of 9 firms
Seven of the eleven firms in this sector report time series data of total emissions. The only firm showing an apparent reduction in emissions is EDF (~6.3 MtCO2 between 2004 and 2006). However, this needs to be verified because EDF does not

actually disclose emissions data in its COPs. They do, however, disclose net electricity production and intensity in terms of emissions per unit of electricity produced. This analysis used these data to estimate net emissions from 2004 to 2006.²⁸

- Emissions intensity:
 - Percentage of firms reporting intensity: 55%
 - Sectoral Definition(s):
Participants in the Utility sector are primarily drawn from the power sector, where there is a relatively straightforward measure of emissions intensity based on emissions per unit of energy output. The most common is kg CO2e per MWh; however, there is still some disparity. Firms do not all specify whether they are reporting CO2 -equivalent units or purely CO2. In addition, some firms report in g CO2 per kWh, which are identical to kg per MWh; others report tons per MWh, which differ by a factor of 1000. Current intensities reported in CDP6 are given in the table below.

27 The reporting period varied and ranges from 2002-2008. Therefore these data may refer to any time span between two and six years.
28 The calculation is simple: Emissions (tCO2) = Production (GWh) * Intensity (tCO2/GWh). However, the accuracy of this estimation depends on whether each annual quantity is derived from the same set of facilities, which was difficult to discern from the COPs.

Table 54: Emissions intensities reported in the Utilities sector

Firm	Intensity measure	Most recent value reported
EDF	tCO2/MWh	0.120
E.ON AG	tCO2/MWh	0.500
RWE	tCO2/MWh-e per MWh	0.861
Union Fenosa SA	tCO2/MWh	0.472

Four firms also report intensities from Scope 1 and Scope 2 emissions in terms of revenue

as requested in CDP6 question 3(b)ii. These are shown in the table below.

Table 55: Tons of CO2-e reported under Scope 1 and Scope 2 per million USD in turnover

Firm	Scope 1	Scope 2
E.ON AG	1288	34.9
RWE	2441	554
Union Fenosa SA	2684	59
Suez Environnement	1274	Not reported

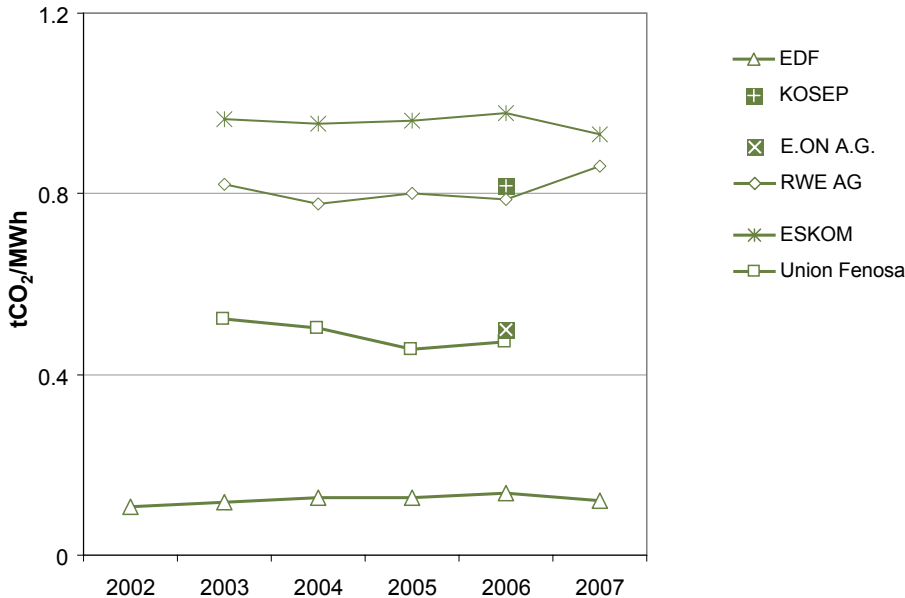
- Percentage of firms showing a reduction in intensity: 27%

Four firms in this sector report time series of emissions intensity. Of these, ESKOM and Union Fenosa report a decrease. EDF reports a substantial decrease between 2006 and 2007; however, the 2007 data is still 11% higher than the intensity they reported in 2002. Moreover, they note that the 2007 data exclude two subsidiaries with thermal power generation assets²⁹. Therefore, the decrease in the final years may simply be the result of missing data.

In addition, all firms’ data should be interpreted cautiously as all utilities appear to show variability in intensity with small increases and decreases observable over time. Thus, a net decrease over three to four years should not be interpreted as a stable downward trend.

29 Based on information in EDF’s 2005 – 2007 CSR reports (available at http://www.edf.fr/html/ra_2005/uk/pdf/ra2005_indicators_va.pdf; <http://www.edf.com/html/RA2006/uk/dd.html> and; http://www.edf.com/html/RA2007/uk/dd/data/rapport_annuel_edf.pdf).

Figure 16: Emission intensities reported by Utilities





- Percentage of firms setting targets: 55% (targets are described in the table below).

Table 56: Emission reduction or intensity targets described in COPs or CDP submissions in Utilities Sector

DONG Energy	43% reduction of CO2 emissions below 1990 levels by 2012
ESKOM	Increase of renewables component to at least 1,600MW by 2025 (from 2008 CSR report http://www.eskom.co.za/annreport08/ar_2008/bus_impact_04.htm)
E.ON A.G.	Absolute emissions: 50% below 1990 by 2030 (equivalent to an intensity target of 0.36 tonnes CO2/MWh)
Korea South-East Power Co. (KOSEP)	10% reduction from 2003 CO2 standard
Union Fenosa	5% reduction, by 2010, in emissions from coal power plants compared with 1990 and 27% compared with 2004. 4% reduction, by 2010, in specific emissions from thermal generation and 20% in production mix in Spain compared with 1990. Reduction, by 2012, in GHG emissions in developing countries equivalent to 7% of emissions by Union Fenosa in 1990 (0.76 Mt CO2).
RWE AG	2012: reduction of appr. 38 million t CO2 equivalent to some 21 % reduction, 2015: reduction of appr. 63 million t CO2 equivalent to some 37 % reduction

- Experience with emissions trading and offsets:
All of the EU-based power generation firms in this sector have facilities covered by the EUETS. In addition, many of them participate in other carbon market activities including CDM and JI.

Table 57: Utility firms participating in Carbon offset and emissions trading schemes (blank cells indicate no activity)

Firm	EUETS	CDM/JI	Other
DONG	Company has facilities covered by the EU ETS.	Firm is purchasing CERs from CDM projects in China and Latin America (UNEP CDM pipeline, 2009)	
EDF	Company has facilities covered by the EU ETS.	Company has created a subsidiary, EDF trading, that is very active in the CDM market.	
E.ON AG	Company has facilities covered by the EU ETS.	<ul style="list-style-type: none">• Centralizing its activities relating to JI/CDM within a new unit: E.ON Climate & Renewables.• Currently involved in a potential CDM project in Shanxi, China, providing coal-fired power stations with labs to analyze and optimize plant processes Thus far, up to 7 million tons of CO2 have been prevented in China.	
Gamesa		Gamesa has promoted 3 wind farms under Clean Development Mechanism (CDM) framework. All are registered and will avoid more than 725,000 tCO2/year.	
RWE	Company has facilities covered by the EU ETS.	Will provide 90 MtCO2 in offsets between 2008 and 2012. Already earmarked a budget of €150 million for own projects. By March 2008 ~25 MtCO2 had been contractually guaranteed (2/3 from JI/CDM projects by third parties and 1/3 came from RWE’s own climate protection projects).	
Suez Environnement	Company has facilities covered by the EU ETS.	SUEZ would have the ability to use about 25 Mt of CDM/ JI credits in the 2008-2012 period. The intention of the group is to fully utilize cheaper compliance options under the EU-ETS. All credits eligible under the EU-ETS are considered, with the intention to diversify, for example: <ul style="list-style-type: none">• Biomass cogeneration unit in Brazil• Electrabel’s 5 MUS\$ participation in the Prototype Carbon Fund• Electrabel’s purchase of 220,000 JI credits from New Zealand Tararua wind farm.	SUEZ Energy North America (SENA) is actively tracking and participating in the development of US climate change legislation, such as the Regional Greenhouse Gas Initiative (RGGI).

• Scope coverage:
Five firms in this sector report emissions disaggregated by Scope 1 and 2. Three of the five also report Scope 3, though inconsistently. For example, looking at CDP 5/6 data, E.ON reports Scope 3 for just one year out of five. RWE reports it for one year out of three. Union Fenosa reports Scope 3 emissions for two years running, but the magnitude varies by a factor of 300. The figure below shows emissions for the Utility disaggregated by Scope.

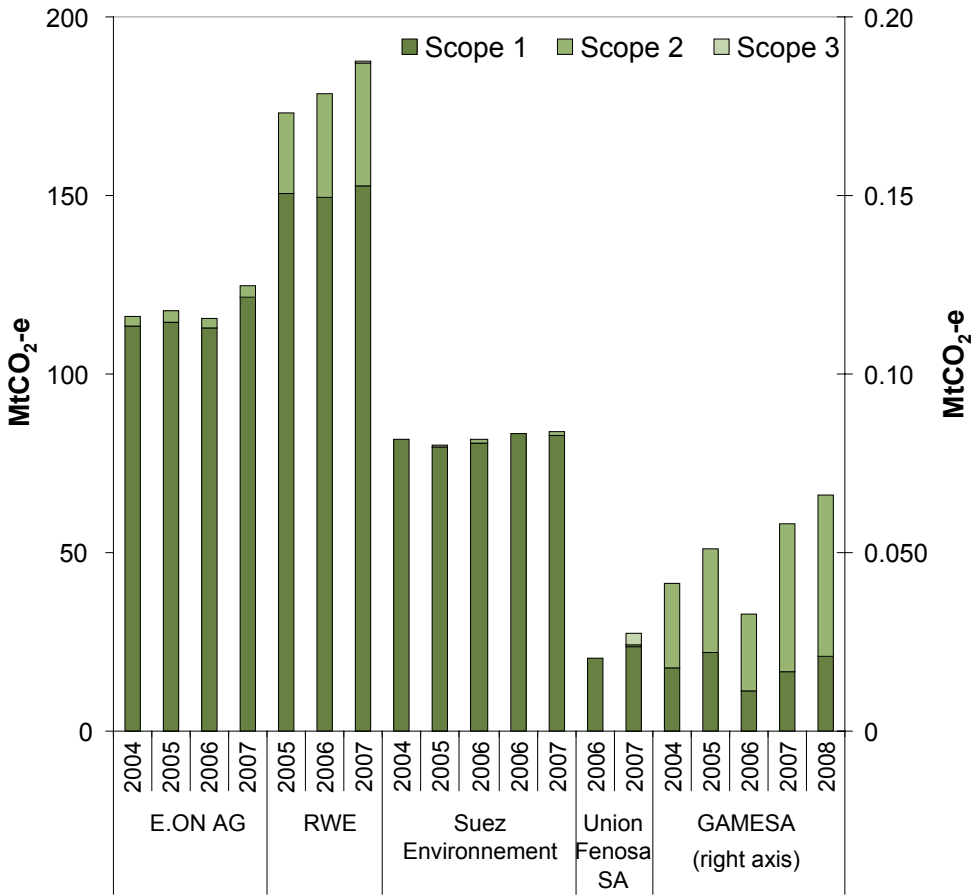
In addition, conventional wisdom holds that Scope 1 dominates emissions in the power sector³⁰. This appears to hold true for most utilities reporting in this sector: Scope 1 constitutes 80-99% pf total emissions. However, this is sensitive to the level of detail included in Scope 3 emissions. For

example, in their CDP5 report (covering 2006) E.ON reports Scope 3 emissions in excess of 70 MtCO₂. In CDP6, they published a correction to this, along with corrections going back to 2004. None of the corrections include Scope 3 emissions.

One firm, Gamesa, breaks from this pattern. Gamesa reports Scope 1 and 2 only, and their emissions are dominated by Scope 2 (roughly 2 to 1). This is not unexpected, as Gamesa is not a utility in the conventional sense, but a wind turbine manufacturer. Note their emissions are ~1/1000 of the other firms in this sector.

30 See, for example, Matthews, et al. (2008). "The Importance of Carbon Footprint Estimation Boundaries." Environmental Science & Technology 42(16): 5839-5842. <http://pubs.acs.org/doi/abs/10.1021/es703112w>

Figure 17: GHG emissions by Scope in the Utility Sector (Gamesa is on the right-hand axis)



4. Concluding Thoughts

This report presents an analysis of public GHG emission disclosures among 145 large companies that had become C4C signatories as of September 2008. This final section attempts to draw preliminary conclusions from what is, by all accounts, a nascent process. It is apparent from reviewing public disclosures that there is a great deal of learning occurring at the firm level. For many companies, collecting and reporting emissions data has been incorporated into common practice. 89 companies disclose some form of absolute emissions data; 70 report of these two or more years of data and 27 report three or more years of data, which enables us to start examining trends in a meaningful way. Similarly, 54 companies report some form of emissions or energy intensity; 20 of these report more than one year of data and 13 firms report times series data of emission intensities covering three or more years. Whether or not these trends demonstrate emissions or intensity reductions, the firms are to be commended for being early movers and taking the crucial step of publicly accounting for their contribution to anthropogenic climate change.

When we look for reductions in GHG emissions among signatories, the results are not as encouraging. Only a small fraction of C4C signatories, 20 companies in all, report reducing their GHG emissions over the past few years. Similarly, 13 firms report reducing emission intensities. Three firms report both reductions in intensity and overall emissions.

Of course, we acknowledge that most firms are only beginning to consider monitoring and reducing their GHG emissions. C4C only began in July 2007. More established programs encouraging public disclosure of emissions data also have mixed results. For example, CDP's most recent cycle (CDP6) lists 3,501 firms contacted to participate. Of these, 2,190 (63%) provided some response. However, 556 (25%) of those firms opted not to publicly disclose their data³¹. Further, among the 1625 that did choose to disclose their data, 523 (32%) did not report any GHG emissions.

These preliminary results raise several important questions. First, close scrutiny of disclosure data reveals that data quality is questionable and accessibility is limited. We need to consider how the quality of and accessibility of disclosure data can be assured.

A second, related question concerns the goals and intended audience of publicly disclosed data. What do firms hope to achieve by making this data public and who do they target with this data? Third, we should consider why non-disclosing firms, which have publicly acknowledged the importance of climate change by joining the C4C initiative, do not make data publicly available

Data quality and data accessibility are both crucial to the success of public GHG emissions disclosure. Without a reasonable level of quality assurance and relative ease of accessibility, firms may not recognize the potential benefits of publicly disclosing emissions data.

How can data quality be measured and assured? Many firms use an external verifier or auditor³². However, while external auditors may add a degree of confidence to the reporting, we found several instances of questionable disclosures that were vetted by auditors. For example³³:

- Munich Re reports emissions that increase from 32,700 ktCO2 in 2006 to 186,625 ktCO2 in 2007 (CDP 5 and 6 respectively). Both reports are based on data that was externally verified and the 2007 report specifically claims that emissions “do not vary significantly” from the previous accounting year (response to question 2.f). While it is possible that the firm is reporting data that reflects the emissions of different business units from one yer to the next, this is not clear from the CDP submissions. In addition, the firm’s COP submissions to UNGC only report emissions per employee, so they do not provide any means of cross-checking.
- Sompo Japan Insurance reports a 47% increase in emissions from 2005 to 2007 and wildly inconsistent breakdowns between Scope 1, 2 and 3 in those three years. Each year was externally audited and, like Munich Re, SOMPO claims that emissions “do not vary significantly” (question 2.f, CDP6).
- RICOH: between 2006 and 2007 the firm reports Scope 3 emissions that vary from 4.5 MtCO2 to 1.4 MtCO2 as a result of a single end-use factor that was included in the former year and omitted from the latter. Data from both years were audited by the same firm.

This is not to claim that auditing is not an effective quality assurance mechanism. We do, however, think it is important to point out that GHG emissions disclosure represents a complex reporting task for which accounting practices are yet mature as they are in financial accounting. Thus, there are many potential points for slippage. For example, RICOH’s inconsistency highlights the difficult nature of setting appropriate boundaries in order to define Scope 3 emissions. Of course, the difficulty is not simply linked to Scope 3. It runs through the spectrum of direct and indirect emissions. However, unlike with financial accounting, carbon accounting is rarely scrutinized, thus errors or inconsistencies are of little immediate consequence. Of course, errors in accounting are directly linked to the environmental integrity of actions that companies and others take to combat climate change. They are therefore very consequential in the long term.

The second issue to be addressed is that of accessibility. How easy is it to access publicly disclosed data? The instinctive answer might be that if data is publicly disclosed it must be easily accessible. Unfortunately, this is not always the case.

In our view, there are two dimensions to the question of access to publicly disclosed data. The first concerns the ease of access to data from a single firm. This is clearly hit or miss. As we have reported, roughly 60% of the C4C signatories report at least one year of total emissions, but less than half of the signatories analyzed have reported two years or more. In addition, there are some firms that do not disclose data in their COPs, but provide it elsewhere. For example, Infosys does not provide total emissions in its COP, but does disclose emissions in its responses to CDP and “Sustainable Development Report” that can be downloaded from its website³⁴. Similarly , Munich Re only reports an employee-based intensity in its COPs, but provides emissions data via CDP. Thus, finding emissions data from a single C4C firm has the characteristics of a coin toss — some degree of persistence will yield a data roughly 50% of the time.

The real challenge to access comes when “the public” wishes to obtain cross-sectional data from a group of companies. COPs typically take the form of corporate CSR

reports that may be up to 200 pages long. These must be “mined” for data using some software-based text search. Collecting data from multiple firms and/or multiple years can be extremely time consuming. In addition, firms use different terminology (GHG emissions, carbon dioxide, CO2, carbon), so that text searches may miss important data.

Standardized disclosure formats like those used by the CDP are much more accessible. However, the CDP charges for access to its fully functional search platform. Thus, like UNGC COPs, the “public disclosure” of CDP data is also limited to relatively low-bandwidth files that provide access to a single firm’s submission for a single year. The CDPs “high-bandwidth” multi-firm and multi-year access must be paid for, and is not publicly accessible in the true sense.

Both UNGC and CDP can improve on the degree to which the data they collect is made available to the public at little additional cost to the firms. Structured surveys are much more accessible than weighty reports, but full data sets that are generated from these surveys should be made publicly available in order to be truly “disclosed”.

31 It is not clear why firms participate in the “Carbon Disclosure Project”, but opt out of publicly disclosing their data.
32 We have not assessed COPs for proof of external verification or auditing. However, recent CDP questionnaires ask participants about this (question 2.d.i).
33 We highlight these inconsistencies not because we wish to shed negative these firms, but rather because they present examples of quality control problems in “externally audited” data.
34 <http://www.infosys.com/beyond-business/infosys-sustainability-report-0708.pdf>

Appendix A: List of firms analyzed, recent annual emissions, changes in emissions and intensities, and targets. Firms are ordered by the largest relative emissions reductions.

Company	Annual Emissions		Reported Annual Change in Emissions			Change in Intensity				Target	Comments
	ktCO2	Year	Years	ktCO2/yr	%/yr	%	Units	Years	Annual change (%/yr)		
Akzo Nobel NV (Health Care)	3,200	2007	2006-2007	-2,000	-38%						Through 2006 the firm's CO2 emissions included emissions of non-consolidated joint venture cogeneration plants. Starting in 2007, the firm took these plants out their environmental accounting to be in line with our financial reporting.
Anglo American (Basic Resources)	24,472	2007	2006-2007	-11,928	-33%					Reduce carbon intensity 10% and energy intensity 15% from 2004 to 2014	Large drop in emissions is due to two major divestitures in 2007 and a methodological change in the way the firm reports fugitive emissions (CDP6 submission)
Development Bank of the Philippines (Financial Services)	14	2004	2003-2004	-4	-24%						Reduction reported for 2003-4, but more recent data is unavailable
Areva (Technology)	1,306	2007	2006-2007	-114	-10%					By 2011 (2004 baseline), reduce energy consumption by 20% and GHG emissions by 50% on equity basis	No data on intensity.
ABB Ltd. (Technology)	1,577	2007	2006-2007	-164	-9%					5% less use of energy per output unit (rolling target over two years)	Firm only reports intensity data for 2006 - no trends are available.
Lindex (Retail)	10	2007	2005-2007	-1	-9%					Numerous country level electricity and transportation goals (see 2007 CSR report)	The firm presents very detailed Scope 3 emissions from 2006 onwards.
Johnson Controls, Inc. (Automobiles & Parts)	1,726	2007	2002-2007	-135	-8%					Reduce Scope 1 and 2 emissions by 30 % per dollar revenue from 2002-2012	Most of the reductions are the result of correcting errors and omissions in data and methods previously used to estimate emissions (CDP 6 submission).
Infosys (Technology)	212	2008	2007-2008	-18	-8%					Reduce energy consumption per employee by 5%	CDP6 submissions listed wrong units and UNGC website links to "Annual Reports" which do not contain emissions data. Correct information was obtained from Corporate Sustainable Development Report at http://www.infosys.com/beyond-business/infosys-sustainability-report-0708.pdf
Unilever (Food & Beverage)	2,704	2007	2002-2007	-343	-7%	32%	kg CO2 per ton output	1998-2008	-3%	Reduce energy-based emissions intensity in manufacturing by 25% by 2012 (2004 baseline).	Improvements in overall emissions and intensity, but intensity only accounts for emissions from energy. CDP5 and 6 reports include Scope 3 emissions in approaching 200 MtCO2 (from consumer end-use). These are not included in this analysis.
Westpac Banking Corporation (Financial Services)	115	2007	2003-2007	-8	-5%					5% emissions reductions on a continual "rolling" basis	The firm claims emissions reductions of 40% since 1996.
Auchan France (Retail)	45	2007	2003-2007	-3	-5%						Emissions are only reported for the firm's transportation.
Japan Airlines (Industrial Goods & Services)	15,020	2007	2006-2007	-771	-5%					20% fuel reduction, 10% thermal/electric consumption by 2010 (1990 baseline)	Reducing emissions through more fuel-efficient aircraft, increasing traffic volume handled by new aircraft, reducing thermal and electric energy consumption, and substituting "Ground Power Units" for "Auxiliary Power Units" to supply electricity to aircraft on the ground.

Company	Annual Emissions		Reported Annual Change in Emissions			Change in Intensity				Target	Comments
	ktCO2	Year	Years	ktCO2/yr	%/yr	%	Units	Years	Annual change (%/yr)		
Deutsche Telekom (Telecommunica-tions)	2,551	2007	2004-2007	-119	-4%					Multiple targets have been set and achieved (see main text).	Through a combination of buying RECS, using CHP, and reducing electricity use, decreased emissions; no intensities reported
EDF (Utilities)	78,300	2006	2004-2006	-3,116	-4%	11%	tCO2/MWh	2002-2007	2%		Firm does not disclose total emissions. This analysis esti-mated emissions from published intensity and production data. Estimates show decreasing emissions, but increasing intensity between 2002 and 2007.
Dupont (Chemicals)	12,397	2008	1990-2008	-1,199	-4%					Reduce total emissions by at least 15% from 2004 to 2015	Extended time series of data shows significant emissions reductions, but no disaggregation by Scope.
Novartis Interna-tional AG (Health Care)	1,614	2007	2005-2006	-54	-3%					Reduce on-site Scope 1 GHG emissions by 5% in the period 2008 to 2012, based on 1990 levels	Firm only reports intensity data for 2007 - no trend avail-able
The Coca-Cola Company (Food & Beverage)	4,920	2007	2003-2007	-195	-3%	-19%	MJ per liter of product	2002-2007	-4%		Improvements in overall emissions and intensity. CDP6 report on 2007 emissions included ~15 MtCO2 in Scope 3, which are not included in this analysis.
L'Oreal (Personal & Household Goods)	218	2007	2005-2007	-6	-3%						Company cites general energy efficiency for decrease in emissions; no intensities reported
Aktiebolaget SKF (Industrial Goods & Services)	561	2007	2006-2007	-12	-2%					Reduce Scope 1 and 2 emissions 5% per year	Reductions are for Scope 1 and 2 emissions only. Firm notes output increased by 12% in this period. Methods to calculate Scope 3 emissions are being developed.
Novozymes (Health Care)	908	2007	2006-2007	-13	-1%						Firm reports no intensity data.
Suez (Utilities)	83,422	2007	2004-2007	548	1%						
ENI (Oil and Gas)	67,556	2007	2006-2007	3,832	1%						Firm only reports intensity data for 2007 - no trends are available.
Seiko Epson Corpo-ration (Technology)	907	2007	2004-2007	11	1%	-11%	emis-sions per unit sales	2004-2007	-4%	Reduction of carbon emissions by 90% by 2050	
Cadbury Schweppes PLC (Food & Beverage)	927	2007	2002-2007	15	2%					10% reduction in emission intensity by 2012 (no base year included).	Increasing emissions; no intensity reported. CDP6 report on 2007 emissions included 2.7 MtCO2 in Scope 3, which are not included in this analysis.
Newmont Mining Corp (Basic Resources)	3,870	2007	2005-2007	64	2%						
E.ON AG (Utilities)	124,560	2006	2004-2006	2,280	2%					Absolute emissions: 50% below 1990 by 2030	Increasing emissions; only 1 intensity reported
Metso Corporation (Construction & Materials)	221	2006	2003-2006	5	2%						Emissions decreased by 9% from 2005-2006.
Coca-Cola Hellenic (Food & Beverage)	2,704	2007	2006-2007	62	2%						Increasing emissions; no intensity reported
ICA AB (Retail)	320	2007	2005-2007	7	2%					Reduce energy consumption in stores by 10% by 2010 (2006 baseline); level out total known GHG emissions during 2008	Data is from CSR reports. No intensities are reported.

Company	Annual Emissions		Reported Annual Change in Emissions			Change in Intensity				Target	Comments
	ktCO2	Year	Years	ktCO2/yr	%/yr	%	Units	Years	Annual change (%/yr)		
Nedbank Group (Financial Services)	106	2007	2006-2007	3	3%					Reduce carbon emissions per employee 12% by 2015 (2007 baseline)	Only one year of intensity is provided.
ABN AMRO (Financial Services)	418	2006	2003-2006	12	3%	2%	tCO2 per FTE	2003-2005	1%	In 2007, pledged to become carbon neutral by 2008.	Data shows increasing emissions and intensity. CDP6 is not available to verify progress toward target.
Allianz (Financial Services)	709	2007	2004-2007	21	3%	3%	kg per employee	2003-2005	1%	20% GHG reduction group-wide by 2012	Increasing emissions and intensity
Eskom (Utilities)	223,600	2008	2003-2008	6,700	4%	-4%	tCO2/MWh	2003-2007	-1%	Increasing renewables component to at least 1600 MW by 2025	Increasing emissions; decrease in intensity
RWE AG (Utilities)	152,500	2007	2002-2007	5,100	4%	5%	tCO2-e/MWh	2003-2007	1%	Reduction of ~38 MtCO2-e (21 % reduction) by 2012; reduction of ~63 MtCO2-e (38%) by 2015	Currently emissions and intensity are increasing
Hilti Aktiengesellschaft (Construction & Materials)	42	2007	2005-2007	2	5%	-7%	CO2-e per value added	2005-2008	-2%		Improvements in intensity, but emissions are still increasing.
BBVA, S.A. (Financial Services)	301	2007	2004-2007	15	6%	7%	tCO2e per employee	2003-2006	2%		Increasing emissions and intensity
Dow Chemical (Chemicals)	42,323	2006	2004-2006	2,312	6%					Stop growth of GHG emissions by 2025.	Increase in emissions is due to inclusion of Scope 3 data in 2007. Dow's Scope 1 and 2 emissions dropped by 1% from 2006-2007.
City Developments Ltd (Real Estate)	36	2007	2005-2007	2	6%					5% reduction in electricity use by March 2009	Increasing emissions over time; no intensities reported
Royale Philips Electronics (Technology)	2,346	2007	2006-2007	157	7%						Firm provides thorough Scope 1, 2, and 3 analysis. In CDP6 they include, as a component of Scope 3, emissions from consumer use of products: 318,000 ktCO2. This is not included in this analysis.
COSCO (China Ocean Shipping Company) (Industrial Goods & Services)	13,717	2007	2006-2007	1,028	8%	-35%	kg CO2 per kton-mile	2003-2007	-9%		Net emissions data only includes Scope 1. Firm's 2007 COP submission shows a large increase in Scope 2, but no details are given.
Veolia Environnement (Industrial Goods & Services)	42,802	2007	2006-2007	3,214	8%		"Eco-efficiency" ratio	2007		Veolia Energy -Dalkia has set itself a carbon eco-efficient ratio target of 23% by the year 2011	Firm's "eco-efficiency" measure defined as the global reductions of GHG emissions / Total (scope 1 and scope 2) GHG emissions. Intensity only reported for 2007.
Holmen AB (Basic Resources)	992	2007	2004-2007	65	8%					Reduce fossil fuel use by 90% by 2020	Increasing trend stopped in 2006 and firm reports a 15% decrease in emissions between 2006 and 2007. Target corresponds to 240 ktCO2.
Pfizer Inc. (Health Care)	2,194	2007	2006-2007	214	9%					Reduce total CO2 emissions by 35% per \$ million revenue by 2007 (2000 baseline). Reduce global CO2 emissions 20% by 2012 (2007 baseline)	Firm reports no intensity data
Korea National Housing Corporation (Construction & Materials)	3	2005	2003-2005	0.3	10%						Intensity is not defined

Company	Annual Emissions		Reported Annual Change in Emissions			Change in Intensity				Target	Comments
	ktCO2	Year	Years	ktCO2/yr	%/yr	%	Units	Years	Annual change (%/yr)		
Linde Group (Industrial Goods & Services)	14,740	2007	2006-2007	1,320	10%						In Sept 2006, Linde took over the BOC Group, a large industrial gases company. In Dec 2006, Linde sold its forklift division. These changes led to significant variation.
Lafarge (Construction & Materials)	106,518	2007	2006-2007	10,518	11%					20% reduction in GHG emissions per ton of cement (using 1990 baseline. and a 10% reduction in absolute CO2 emissions in Annex 1 countries.	Increase in emissions is due to a very slight increase in Scope 1 emissions and the inclusion of Scope 2 and 3 emissions. The firm reports that they have achieved 16% reduction in intensity to date (CDP6) and that it uses annual third party verification to monitor progress toward its targets.
Alcan Inc. (Industrial Goods & Services)	31,900	2006	2001-2006	2,260	11%	-4%	tCO2e per \$1000 sales	2001-2005	-1%	Reduce emissions intensity by 10% between 2006 and 2010 (2005 baseline)	Purchased by Rio Tinto in 2007. Its not clear if targets will be continued under new management.
IKEA Group (Retail)	1,189	2007	2004-2007	101	11%					Improve energy efficiency by 25% (2005 baseline). Ultimately to transition to 100% renewable energy (no date specified). Prior goal to reduce CO2 emissions 12% by 2010 was achieved.	
Telecom Italia (Telecommunications)	1,271	2006	2005-2006	133	12%					30% improvement in "ecoefficiency indicator" in 2008 with respect to 2007	Increasing emissions; no intensities reported
Piraeus Bank (Financial Services)	1	2007	2006-2007	5	13%						No intensity data provided.
StatoilHydro (Oil and Gas)	13,503	2008	2006-2007	1,945	14%					Annual reduction of 1.5 million tonnes of CO2e on equity basis by the year 2010	Firm only reports intensity data for 2007 - no trends are available.
China Mobile (Industrial Goods & Services)	7,000	2007	2006-2007	1,000	17%						Rough data of total emissions was reported in China Mobile's 2007 Corporate Social Responsibility report.
Union Fenosa (Utilities)	23,748	2007	2006-2007	3,403	17%	-10%	tCO2-e/MWh	2003-2006	-3%	5% reduction in emissions from coal power plants by 2010 (1990 baseline)	Firm shows increasing emissions, but cites changes in accounting methodology. In 2006, Scopes 1 and 2 only CO2 for electricity generation. In 2007 emissions include CO2, CH4, N2O, SF6 across the entire life cycle (mining, natural gas production, and power T&D.
Sabaf SpA (Personal & Household Goods)	9	2007	2004-2007	1	23%						Emissions data is highly variable: 5,327 (2004), 18,460 (2005); 21,419 (2006); and 8,976 (2007). This calls into question the accuracy of the firm' reporting. No intensities are reported.
Sompo Japan Insurance Inc. (Financial Services)	69	2007	2005-2007	11	24%					5.9 % reduction in energy use by 2007 (2004 baseline)	Firm reports dramatic increase in emissions. Began reporting Scope 3 in 2006. But increase continues through '07. No explanation is provided.
Alcatel-Lucent (Telecommunications)	116	2007	2006-2007	23	24%					10% reduction in total GHG emissions by the end of 2010 (2007 baseline)	Increasing emissions; no intensities reported
Gamesa Corporacion Tecnologica S.A. (Utilities)	66	2006	2004-2006	12	30%						Increasing emissions; no intensities reported

Company	Annual Emissions		Reported Annual Change in Emissions			Change in Intensity				Target	Comments
	ktCO2	Year	Years	ktCO2/yr	%/yr	%	Units	Years	Annual change (%/yr)		
LVMH (Personal & Household Goods)	106	2006	2002-2006	15	34%						Large 2006 increase due to the addition of data from whiskey distallation, which is energy intensive; no intensities reported
Thales (Industrial Goods & Services)	377	2007	2006-2007	99	36%		Metric tonnes of CO2-e per square meter	2007		10% reduction in energy use and CO2-eq per business traveler (baseline year unclear)	Only one year of intensity is reported.
Cisco Systems (Technology)	751	2007	2006-2007	220	41%						Primary drivers for increased reported emissions are business growth and improved reporting coverage. Firm only reports intensity data for 2007 - no trends are available.
RICOH CO. LTD (Industrial Goods & Services)	1,378	2007	2006-2007	455	49%		Scopes 1 and 2 per US\$ million in turnover	2007		Compliance of 35% reduction from 1990 in the actual production amount emission intensity	Increase in emissions appears due to change in Scope 3 accounting. Scope 1 and 2 decrease 17% from 2006-2007.
Bayer AG (Chemicals)	21,300	2007	2004-2007	4,627	62%					Maintain emissions at 2005 levels until 2020 and reduce energy per ton of product 10% by 2015.	The large increase is due to the inclusion of Scope 3 in 2007. If only Scope 1 and 2 are considered, emissions increase by just 3%.
Rio Tinto PLC (Basic Resources)	50,200	2007	2006-2007	22,200	79%					5% improvement in energy efficiency and 4% improvement in GHG intensity from 2003-2008	Scope 1 and 2 emissions increased ~80% between 2006 and 2007 because the firm acquired Alcan Inc, which emitted 20.9Mt CO2-e in 2007. In addition, in 2007 the firm reported Scope 3 emissions for the first time.
UPM-Kymmene (Basic Resources)	8,227	2007	2006-2007	4,417	116%						Emissions increased due to the inclusion of Scope 2 and 3 in 2007. Comparing only Scope 1 reveals a 3% decrease in emissions. Intensities are not reported.
Centrica plc (Oil and Gas)	37,985	2007	2004-2007	9,967	123%	-5%	g CO2/kWh (of company generated power)	2005-2007	-3%	Reduce UK power generation carbon intensity to 380g CO2/kWh by 2012	Started reporting Scope 3 in 2007. If comparing only Scopes 1 and 2, emissions increase by 20%.
Fuji Xerox Company Ltd. (Technology)	703	2006	2000-2006	104	135%	-6%	proprietary "eco-efficiency"	2000-2006	-1%	Rise in "eco-efficiency" to 1.3 by 2004; doubling "eco-efficiency" by 2010	Started reporting Scope 2 and 3 in 2002. If comparing only Scope 1, emissions increased by 121%. Increase is not clearly explained but is believed to be attributed to improved reporting.
Repsol YPF (Oil and Gas)	202,413	2007	2003-2007	58,868	246%	40%	tCO2e/barrel oil produced	2005-2007	20%		Large increase in total emissions is attributable to the inclusion of Scope 2 emissions in 2005 and Scope 3 in 2007. If only Scope 1 is considered, emissions increase by ~14% from 2003-2007. Also, firm reports intensity data in two forms showing opposite trends, but no explanation offered.
Munich Re Group (Financial Services)	187	2007	2003-2007	43	326%					10% emissions reduction: 2006-2012	The firm reports a very large increase in emissions between 2006 and 2007, but offers no explanation. Between 2002 and 2006, emissions had been increasing ~36% per yr. However, the firm also changed the way it accounts for emissions from air travel (see CDP6 submission for details).

Company	Annual Emissions		Reported Annual Change in Emissions			Change in Intensity				Target	Comments
	ktCO2	Year	Years	ktCO2/yr	%/yr	%	Units	Years	Annual change (%/yr)		
OMV Aktiengesellschaft (Oil and Gas)	94,194	2007	2005-2007	43,520	608%						Started reporting Scope 3 in 2007. If comparing only Scope 1, emissions increase by 70%. From 2005 to 2006, emissions nearly doubled due to the acquisition and integration of Petrom. Scope 2 not reported. Firm only reports intensity data for 2007 - no trends are available.
DONG Energy (Utilities)	14,160	2006	2004-2006	6,936	2408%					43% reduction of CO2 emissions below 1990 levels by 2012	Huge increase in emissions is the result of a large merger. In 2006, DONG merged with five other Danish energy companies (Elsam, ENERGI E2, Nesa, Copenhagen Energy, and Frederiksberg Forsyning) As a result, they absorbed a large portfolio of fossil fuel power plants.
Tata Steel (Basic Resources)	10,727	2007				-8%	tCO2e/unit output	2005-2007	-4%	Reduce carbon intensity from 2.13 in 2007 to 1.8 tCO2 per ton output by 2010	Firm only reported emissions from 2007 but notes improvements in intensity from 2005-7.
Sasol Ltd. (Chemicals)	70,343	2007				7%	tCO2-e/ton output	2005-2007	3%	Reduce GHG emissions per ton of product by at least 10% from 2005-2015	Emissions are only reported for 2007 so trend is not available.
Det Norske Veritas (Industrial Goods & Services)						11%	kg CO2 per person-year	2005-2007	6%		Only data on intensity is reported, and this is from an average of 5 offices. 2006 data has been revised due to improved reporting practices.
Landsbanki (Financial Services)	1	2007									Firm only reports data for 2007 - no trend available
Scott Wilson Holdings Ltd. (Industrial Goods & Services)	2	2007								Increase offices with 100% renewable power, introducing "smart metering" and green travel plans	Emissions and intensity data has only been reported for one year, so change cannot be calculated.
AvivaSA Emeklilik ve Hayat (Financial Services)	3	2007									Firm only reports emissions for 2007 - no trend available. No data on intensity
Sekem Group (Food & Beverage)	5	2007									Firm only reports emissions for 2007 - no trend available, and no data on intensity
Essilor International (Health Care)	32	2006									Firm only reports data for 2007 - no trend available
Capgemini (Industrial Goods & Services)	90	2007									Only one year of emission data has been reported through CDP.
Aviva plc (Financial Services)	130	2007								5% emissions reductions on a continual "rolling" basis	Firm only reports emissions for 2007 - no trend available. No data on intensity
Autostrade per l'Italia SpA (Construction & Materials)	186	2007									Emissions are only reported for 2007 so trend is not available. Intensity is not defined
Novo Nordisk (Health Care)	236	2007								Reduce total CO2 emissions by 10% below 2004 levels by 2014.	Firm reports data for 2007, only part of 2008 - no trend available
Redes Energeticas Nacionais, S.A. (Utilities)	268	2005									Only 1 year emissions reported, no intensities reported

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CARBON DISCLOSURE PROJECT

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The Ten Principles of the United Nations Global Compact

HUMAN RIGHTS

- Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights; and
Principle 2 make sure that they are not complicit in human rights abuses.

LABOUR

- Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
Principle 4 the elimination of all forms of forced and compulsory labour;
Principle 5 the effective abolition of child labour; and
Principle 6 the elimination of discrimination in respect of employment and occupation.

ENVIRONMENT

- Principle 7 Businesses are asked to support a precautionary approach to environmental challenges;
Principle 8 undertake initiatives to promote greater environmental responsibility; and
Principle 9 encourage the development and diffusion of environmentally friendly technologies.

ANTI-CORRUPTION

- Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery.

