

CSR ADVISORY WORK FOR ROCHE

DISCLOSING SCOPE 3 GHG-EMISSIONS: SUPPLY CHAIN

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PURPOSE

According to a conference call made in early March 2009 between David Trindell (Roche) and Frank Werner (WEC) this CSR advisory service is provided free of charge due to Roche's membership to the WEC network and due to its limited scope.

Roche asked the World Environment Center (WEC) to help it start a process that can finally result in creating transparency about the carbon footprint in its supply chain.

In this initial phase we agreed upon:

- a) **WEC's advisory to Roche on the first steps to undertake in order to understand the carbon footprint of its supply chain**
- b) **Disclosure of what similar companies have done already**

RECOMMENDATIONS

Given the complexity of global corporations' supply chains, the relatively new demand for this kind of information and the uncertainty of the best methodology to achieve reliable results we recommend the following approach in order to keep the costs and the hours spent on the task as low as possible:

(1) *Make sure you understand what kind of information your important stakeholders exactly demand?*

In our view this refers to

- a. Financial markets, especially the Carbon Disclosure Project (CDP), a group of investors that influence more than 57 trillion US-\$ (2008) and that wishes to understand your company's risks and opportunities, e.g. in a "carbon restricted world",
- b. Procurement departments that need to understand how increasing prices for energy will affect prices of the products they purchase (and the source of that energy),
- c. Suppliers, that need guidance and assistance on establishing sound reporting tools as the ever increasing requirements from customers and government can easily overstrain their abilities.

(2) *Understand your competitors approach and abilities to measure and report on their supply chain's GHG-emissions and which processes leading companies from different sectors have put in place.* Part of this is what we are doing with this document. Please see below.

(3) *Implement existing tools and measures in Roche's supply chain management that have already been tested and that might already be familiar to some of your suppliers.* Our research shows which tools and measures have been used by leading companies. Please see below.

(4) *Define the boundaries of Roche's supply chain from which you choose participants that you want to collaborate with.* We recommend that Roche concentrates on tier 1 suppliers first. Within this group those suppliers with the potentially largest GHG emissions should be looked at first. We recommend a very short questionnaire that is not longer than one page. However, all first tier suppliers should be asked online whether they account for GHG emissions at all.

(5) *Create questionnaires, auditing systems, and tools to build capacity.* Only after Roche has got an overview of its tier 1 suppliers' existing commitment to GHG reporting a more detailed questionnaire can be evaluated. After that, the next step would be to build auditing systems and capacity building programs to assist those less experienced suppliers who want to collaborate on measuring and reporting their GHG emissions.

FIRST RESULTS

Our analysis provides insight into (2) and (3):

Public reporting on scope 3 GHG-emissions at the CDP database (as of April 2009) is very limited.

- a) Only five of a total of 27 pharmaceutical and Life Sciences companies in the FT Global 500 provide information on GHG-emissions in their supply chain (approximately 18%). These companies are AstraZeneca, Baxter, Bayer, Johnson & Johnson as well as Reckitt Benckiser.

The identified five leading companies in the pharmaceutical sector try to understand their suppliers' GHG emissions by making use of the following tools (please see below): From this we learn that all companies with the exception of Reckitt Benckiser rely on estimations and try to adapt calculation methods being made for other product categories. Reckitt Benckiser has developed a trial measurement system in collaboration with URS Corporation Ltd.

- a. AstraZeneca: The information provided refers only to waste incineration. Since 2005 AZ has been working with its outsourcing partners to measure this environmental impact of the manufacture of intermediates and established pharmaceutical brands produced on AZ's behalf, including waste production and CO2 emissions from energy use.
- b. Baxter: Materials and product delivery (estimate 131,000 metric tons) -- Baxter estimates supply chain emissions as half of estimated combined materials and product delivery resulting in a supply chain emissions estimate of 65,500 metric tons
- c. Bayer: To assess its supply chain emissions at Bayer Material Science, by far the largest source of supply chain emissions, Bayer used the "Eco-profile" method which considers all emissions related to the production of Bayer's input materials/products, starting with the extraction of resources from the earth and finishing with the delivery of the finished material/product at the factory gate. In cooperation with other enterprises from the European plastics industry, Bayer has repeatedly revised and updated the eco-profiles for polymers and chemicals accounting for more than 95% of the total GHG emissions within Bayer's BMS supply chain. On this basis, the entire GHG emissions within the BMS supply chain are regularly projected. The supply chain emissions of Bayer Health Care and Bayer Crop Science products were assessed proportionally to the output of BMS. Furthermore, Bayer assumed that Currenta's supply chain GHG emissions amount to about 15% of its direct emissions.
- d. Johnson & Johnson: Company Supply Chain: Johnson & Johnson has joined the Carbon Disclosure Project's Supply Chain Leadership Collaboration which brings together sector leaders wishing to work through the CDP system to measure and subsequently manage emissions through the supply chain. In 2008, J&J is looking to reach out to external manufacturers that represent 80% of the category spend for enrolment in the CDP SCLC reporting process.
- e. Reckitt Benckiser: During 2007 Reckitt Benckiser developed a trial measurement system enabling calculation of emissions associated with the life cycle of its products, in conjunction with URS Corporation Ltd. Data used in the calculation of the life cycle emissions were calculated from primary data relating to specific activities within the company and also from secondary data sources including research studies and journal articles. Specific sources of data used during the calculation of the trial Scope 3 supply chain emissions included:
 - Types and quantities of raw and packaging materials used;
 - Distance travelled and transportation type of raw and packaging materials;
 - Type and quantity of energy used at Reckitt Benckiser, and third party manufacturing sites;
 - Distribution of finished products from Reckitt Benckiser and third party manufacturing sites;

Although Roche is not amongst this group of companies it is providing information on another aspect of scope 3 emissions (employee business travel), something that seven of its competitors have not been doing yet (please see annex 1).

- b) Only 37 of the FT Global 500 companies provide information on GHG-emissions in their supply chain (approximately 7%). Amongst these companies we find especially many companies from the IT/telecommunications industry and the financial sector. Regarding regional origin especially British, American and German companies are able to provide information on their suppliers' carbon footprint. Although many different industries are equally represented in this leading group it is striking that there are no companies from the BRIC countries (please see annex 2)

Another sixteen companies report that they have undertaken initial steps to account for GHG-emissions of their suppliers. We anticipate that this group is indeed much larger. Many companies that do not provide the information to the CDP may still have already set up processes to calculate these and are in the midst of a process that leads the ability to report on them in the near future.

SUMMARY:

Calculations of Suppliers Footprints amongst FT Global 500 companies are in the very initial phase. Although five companies within the pharmaceutical industry can provide estimations of their suppliers' GHG emissions only the British Life Science and Consumer Product's company Reckitt Benckiser has started a sophisticated approach to calculate these in detail by using primary data relating to specific activities identified.

Taking a look at other industries does not provide better results. Only 37 companies (7% of the FT Global 500) provide information on GHG-emissions in their supply chain. We estimate that most of them do not use accurate calculation tools but try to estimate these emissions as good as possible. To understand best practice approaches we recommend taking a closer look at these companies, with a special emphasis on e.g. BASF and Marks & Spencer. Another way of learning and sharing knowledge would be participation in the Carbon Disclosure Project's Supply Chain Leadership Collaboration (SCLC).

ANNEX 1: Companies of the Pharmaceutical and Life Sciences industry listed in the FT Global 500 that report to the CDP on their scope 3 emissions (according to Carbon Disclosure Project's (CDP) inventory of scope 3 emissions as of April 2009 (all four categories))

	i. Employee business travel	ii. External distribution	iii. Use/Disposal of company's	iv. Company supply chain
Abbott Laboratories	✓			
Allergan, Inc.				
AstraZeneca	✓	✓	✓	
Baxter International Inc.	✓	✓		✓
Bayer AG	✓	✓	✓	✓
BIOGEN IDEC Inc.				
Bristol-Meyers Squibb	✓			
Eli Lilly	✓	✓	✓	
Genentech (Roche)	✓			
Gilead Sciences, Inc.				
GlaxoSmithKline	✓	✓	✓	
Johnson & Johnson	✓	✓	✓	
Merck & Co., Inc.				
Novartis	✓			
Novo Nordisk				
Pfizer Inc.				
Reckitt Benckiser	✓	✓	✓	✓
Roche Holding AG	✓			
Schering-Plough	✓			
Wyeth				

✓	<i>Reported</i>
	<i>Systems being elaborated</i>
	<i>Not reported</i>

ANNEX 2: FT Global 500 companies that report on their scope 3 supply chain emissions, or that state that they have begun measuring them (according to Carbon Disclosure Project's (CDP) inventory of scope 3 emissions as of April 2009 (all four categories))

	i. Employee business travel	ii. External distribution	iii. Use/Disposal of company's	iv. Company supply chain
Allianz SE	✓			✓
AstraZeneca	✓	✓	✓	
Barclays	✓			
BASF	✓	✓	✓	✓
Baxter International Inc.	✓	✓		✓
Bayer AG	✓	✓	✓	✓
Cadbury Schweppes	✓	✓		✓
Canadian Imperial Bank of Commerce (CIBC)	✓			✓
Canon		✓	✓	✓
Credit Suisse	✓	✓	✓	✓
Dell	✓			
Denso Corporation	✓	✓	✓	✓
Deutsche Telekom				
Diageo	✓	✓	✓	
E.ON				
Ericsson	✓	✓	✓	✓
Exelon Corporation				
Fortum	✓	✓	✓	✓
Gas Natural SDG SA	✓			✓
Gaz de France	✓			✓
Iberdrola	✓	✓	✓	✓
Imperial Tobacco Group				✓
IBM	✓	✓	✓	✓
Johnson & Johnson	✓	✓	✓	
Johnson Controls	✓	✓	✓	✓
Komatsu Ltd.	✓	✓	✓	✓
Manulife Financial	✓	✓	✓	✓
Marks & Spencer Group	✓	✓	✓	✓
Matsushita Electric Industrial	✓	✓	✓	✓
Microsoft Corporation	✓	✓	✓	✓
Mitsubishi UFJ Financial Group	✓	✓	✓	✓
Nestle		✓	✓	✓
News Corporation	✓			✓
Nissan Motor	✓	✓	✓	✓
Nokia Group	✓	✓	✓	✓
PepsiCo, Inc.				✓
Reckitt Benckiser	✓	✓	✓	✓
Renault			✓	
Rio Tinto		✓	✓	
Royal Bank of Canada	✓			✓
Royal Bank of Scotland Group	✓			
Scottish & Southern Energy	✓	✓		
Siemens AG	✓			
Simon Property Group				✓
Societe Generale	✓			✓
Taiwan Semiconductor	✓			✓

Manufacturing				
TeliaSonera	✓	✓		✓
Tesco	✓			
UBS	✓		✓	✓
Unilever	✓	✓	✓	✓
Union Fenosa SA	✓		✓	✓
Volkswagen				
Westpac Banking				

✓	<i>Reported</i>
	<i>Systems being elaborated</i>
	<i>Not reported</i>

ANNEX 3: Complete overview of FT Global 500 companies' status of scope 3 emissions according to Carbon Disclosure Project's (CDP) inventory of scope 3 emissions as of April 2009 (all four categories)

The compilation uses data from the publicly available CDP-inventory. Some companies might have established ways to identify scope 3 emissions although they do not publicly report the data. This might be true especially if companies are in the process of measuring these emissions but aren't able to present a reliable figure yet. However, given CDP's strong incentive to report scope 3 emissions we assume that the vast majority of companies that are able to provide reliable data do report them to the CDP. **In addition to the 312 companies that we have analyzed there are 188 companies that do not report their GHG emissions to the CDP.**

	i. Employee business travel	ii. External distribution	iii. Use/Disposal of company`s	iv. Company supply chain
3M Company				
ABB				
Abbott Laboratories	✓			
Abertis Infraestructuras				
Accenture				
Adobe Systems, Inc.	✓			
Aegon NV	✓			
Aetna Inc.				
AFLAC Inc.				
Air Liquide	✓	✓		
Air Products & Chemicals				
Akzo Nobel				
Alcoa Inc				
Allergan, Inc.				
Allianz SE	✓			✓
Allstate Corporation	✓			
Alstom				
Altria Group Inc.				
Ambev - Cia. Bebidas das Americas				
American Express Company	✓			
American International Group	✓			
Anadarko Petroleum Corporation				
Anglo American	✓	✓		
Anglo Platinum				
Anheuser-Busch Companies, Inc.				
Apache Corporation				
Apple Computers Inc.				
Applied Materials Inc.	✓			
Arcelor Mittal				
AstraZeneca	✓	✓	✓	
AT&T Inc.				
Australia and New Zealand Banking Group Limited	✓			
Aviva	✓			
AXA Group	✓			
Banco Bradesco S/A	✓	✓	✓	
Banco do Brasil S/A				
Banco Itau				

Banco Popular Espanol	✓			
Banco Santander				
Bank of America Corporation		✓		
Bank of Montreal	✓			
Bank of Nova Scotia (Scotiabank)	✓			
Barclays	✓			
Barrick Gold				
BASF	✓	✓	✓	✓
Baxter International Inc.	✓	✓		✓
Bayer AG	✓	✓	✓	✓
BB&T Corporation				
BBVA	✓			
Becton Dickinson & Co.				
Best Buy Co. Inc.				
BG Group			✓	
BHP Billiton	✓		✓	
BIOGEN IDEC Inc.				
BMW Group	✓	✓		
Boeing				
BP			✓	
Bristol-Meyers Squibb	✓			
BT Group	✓			
Burlington Northern Santa Fe Corporation				
Cadbury Schweppes	✓	✓		✓
Canadian Imperial Bank of Commerce (CIBC)	✓			✓
Canadian National Railways				
Canon		✓	✓	✓
Capital One Financial				
Carnival Corporation				
Carrefour	✓	✓	✓	
Caterpillar Inc.				
Centrica	✓		✓	
CEZ				
Chevron Corporation				
China Shenhua Energy Company Ltd.				
Chubb Corporation				
Chubu Electric Power				
Cisco Systems Inc.	✓			
Citigroup Inc.	✓		✓	
Coca Cola Comapny	✓			
Colgate Palmolive Company	✓			
Comcast Corporation				
Commonwealth Bank of Australia				
CVRD-Vale				
ConocoPhillips				
Corning Inc.				
Costco Wholesale Corporation				
Credit Suisse	✓	✓	✓	✓
Danone	✓			
Danske Bank	✓			

Deere & Company				
Dell	✓			
Denso Corporation	✓	✓	✓	✓
Deutsche Bank	✓			
Deutsche Post				
Deutsche Telekom				
Devon Energy Corporation				
Dexia	✓			
Diageo	✓	✓	✓	
DnB NOR				
Dominion Resources				
Dow Chemical				
Duke Energy Corporation				
E.I. du Pont de Nemours & Company				
E.ON				
eBay Inc				
Eli Lilly	✓	✓	✓	
EMC Corporation	✓			
Emerson Electric				
Encana				
ENEL				
ENI			✓	
Entergy Corporation				
EOG Resources				
Ericsson	✓	✓	✓	✓
Erste Bank der österreichischen Sparkassen AG				
Exelon Corporation				
Exxon Mobil				
FedEx Corporation				
FirstEnergy Corporation				
Fortis	✓			
Fortum	✓	✓	✓	✓
FPL Group, Inc	✓		✓	
France Telecom	✓			
Franklin Resources, Inc.	✓			
Freeport-McMoRan Copper & Gold				
FujiFilm Holdings Corporation		✓		
Gas Natural SDG SA	✓			
Gas Natural SDG SA	✓			✓
Gaz de France	✓			✓
Genentech	✓			
General Mills Inc.	✓			
Gilead Sciences, Inc.				
GlaxoSmithKline	✓	✓	✓	
Goldcorp Inc				
Google Inc.				
H&M Hennes & Mauritz AB	✓	✓		
Halliburton Company	✓			
Hang Seng Bank				
Hartford Financial Services Group Inc.	✓			

HBOS - see Lloyds Banking Group	✓			
Hess Corporation				
Hewlett-Packard Company	✓	✓		
Hitachi		✓	✓	
Holcim	✓			
Honeywell International Inc.				
HSBC Holdings	✓	✓		
Iberdrola	✓	✓	✓	✓
Impala Platinum Holdings				
Imperial Oil				
Imperial Tobacco Group				✓
InBev				
Inditex		✓		
Infosys Technologies Ltd	✓	✓		
ING Group	✓			
Intel Corporation	✓			
International Business Machines Corporation	✓	✓	✓	✓
Intesa Sanpaolo S.p.A	✓			
Johnson & Johnson	✓	✓	✓	
Johnson Controls	✓	✓	✓	✓
JP Morgan Chase & Co.				
Kansai Electric Power				
KBC Group				
KDDI Group				
Kellogg Company				
Kimberly-Clark Corporation	✓	✓		
Komatsu Ltd.	✓	✓	✓	✓
Korea Electric Power				
KPN				
Kraft Foods				
Kroger				
L' Oreal				
Lafarge	✓	✓		
Linde	✓			
Lloyds Banking Group	✓			
MAN AG				
Manulife Financial	✓	✓	✓	✓
Marathon Oil Corporation				
Marks & Spencer Group	✓	✓	✓	✓
Matsushita Electric Industrial		✓	✓	✓
McKesson Corporation				
Medco Health Solutions Inc.				
Merck & Co., Inc.				
Merrill Lynch & Co., Inc.	✓			
Metro AG				
Microsoft Corporation	✓	✓	✓	✓
Millea Holdings	✓			
Mitsubishi Corporation				
Mitsubishi Estate				
Mitsubishi UFJ Financial Group	✓	✓	✓	✓
Mizuho Financial Group				
Monsanto Company	✓			

Morgan Stanley & Co. Inc	✓		✓	
Motorola Inc.				
MTN Group				
Munich Re	✓			
National Australia Bank	✓			
National Bank of Greece SA				
National Grid	✓			
Nestle		✓	✓	✓
Newmont Mining Corporation				
News Corporation	✓			✓
NIKE Inc.				
Nintendo				
Nippon Steel				
Nippon Telegraph & Telephone			✓	
Nissan Motor	✓	✓	✓	✓
Nokia Group	✓	✓	✓	✓
Nomura Holdings				
Norfolk Southern Corporation				
Northrop Grumman Corporation				
Novartis	✓			
Novo Nordisk				
NTT DoCoMo				
Occidental Petroleum Corporation				
Oil & Natural Gas				
OMV			✓	
Oracle Corporation				
PepsiCo, Inc.				✓
Pernod-Ricard				
Petro Canada				
Pfizer Inc.				
Philips Electronics	✓	✓	✓	
PNC Financial Services Group, Inc.				
Potash Corporation of Saskatchewan				
Praxair, Inc.	✓	✓		
Procter & Gamble Company				
Prudential				
Prudential Financial, Inc.				
PTT				
QBE Insurance Group	✓			
QUALCOMM Inc.				
Raytheon Company				
Reckitt Benckiser	✓	✓	✓	✓
Renault			✓	
Repsol YPF		✓	✓	
Reynolds American Inc.				
Rio Tinto	✓	✓	✓	
Roche Holding AG	✓			
Royal Bank of Canada	✓			✓
Royal Bank of Scotland	✓			

Group				
Royal Dutch Shell	✓		✓	
RWE	✓	✓	✓	
SABMiller				
Saint-Gobain				
Sandvik AB				
Sasol				
Schering-Plough	✓			
Schlumberger Limited				
Schneider Electric				
Scottish & Southern Energy	✓	✓		
Shinhan Financial Group Company Ltd				
Siemens AG	✓			
Simon Property Group				✓
SK Telecom				
Societe Generale	✓			✓
Sony Corporation		✓	✓	
Southern Company				
Sprint Nextel Corporation				
Standard Bank Group	✓			
Standard Chartered	✓	✓	✓	
State Bank of India				
State Street Corporation				
StatoilHydro	✓			
Suez	✓			
Suncor Energy Inc				
Swiss Re	✓			
Swisscom	✓		✓	
Taiwan Semiconductor Manufacturing	✓			✓
Target Corporation				
Tata Consultancy Services				
Telecom Italia	✓			
TeliaSonera	✓	✓		✓
Telstra Corporation Limited				
Tepco				
Tesco	✓			
Texas Instruments Incorporated				
Thermo Fisher Scientific Inc				
Thomson Corporation				
ThyssenKrupp AG				
Time Warner Inc.				
Toronto-Dominion Bank	✓			
Total	✓	✓	✓	
Toyota Motor				
TransCanada Corporation				
Travelers Companies. Inc				
U.S. BanCorp	✓			
UBS	✓		✓	✓
Unicredit Group	✓			
Unilever	✓	✓	✓	✓
Union Fenosa SA	✓		✓	✓
United Parcel Services, Inc.			✓	

United Technologies Corporation	✓			
UnitedHealth Group Inc				
Veolia Environnement	✓			
Verizon Communications Inc.				
Vinci				
Vivendi Universal	✓			
Vodafone Group	✓			
Volkswagen				
Wachovia Corporation				
Walgreen Company				
Wal-Mart Stores, Inc.				
Walt Disney Company				
Weatherford International Ltd.				
Wells Fargo & Company	✓			
Wesfarmers				
Westfield Group				
Westpac Banking				
Williams Companies				
Woolworths Limited				
Wyeth				
Xstrata			✓	
XTO Energy Inc.				
Yahoo Japan				
Yahoo! Inc.	✓			

✓	<i>Reported</i>
	<i>Systems being elaborated</i>
	<i>Not reported</i>